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USSR Report

TRANSPORTATION

No. 108

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CONTENTS

TUPOLEV COMMENTS ON TU-154M REPORTED

Moscow IZVESTIYA in Russian 13 Oct 82 p 3

[Article by V. Belikov: "Tu-154M Rises into the Sky"]

[Text] The senior collective of Soviet airplane construction, the OKB [Experimental Design Bureau] imeni A. N. Tupolev, is marking its 60th anniversary. This anniversary is marked by the birth of a new liner for the air routes.

Even mentally it is impossible to envision an air field on which it would be possible to assemble all of the machines created in this design bureau by several generations of our aeronautical engineers. More than 150 experimental developments, many dozens of which were then built in large series of several hundred, and even thousands of units! And among this great number of aircraft there was not a single model which did not become a noted phenomenon in aviation, which did not mark by its birth a new stride in its technical progress.

Even the first models created by A. N. Tupolev and his associates in the years 1922-1924 were innovative in principle: they were built of metal, the first domestic Duralumin-type alloy, although everyone else preferred planes made of wood, plywood and cloth. In 1925 the TB-1 (ANT-4), the first all-metal two-motor heavy monoplane in the history of airplane construction rose into the air, a plane which became a prototype for all currently existing airships.

After this winged giant, even in the contemporary meaning of the word (the wing-span was about 30 meters!) followed a whole family a huge machines for various purposes: the first "flying fortress, the TB-3, which landed the Papanin expedition at the North Pole, the red-winged ANT-25, which established an absolute distance record in a Moscow-North America crossing, the political propaganda plane "Maksim Gor'kiy," the largest multiengine passenger planes of the 1930s, the "Wings of the Soviets," and the 36-seat ANT-14.

An amphibious airplane, on which in 1940 an entire constellation of world records was set for speed, lifting capacity and height of flight, was the last pre-war machine of the OKB, headed in those years by A. N. Tupolev.

The Tu-104 liner is properly considered the flagship of jet-age civil aviation. But for the Tupolev group, the jet era began a decade prior to the start of the "One-hundred-Four." In 1947 a bomber with two turbojet engines rose, an updated version of the Tu-2 dive bomber used at the front.

"I don't doubt for a second," confirmed A. N. Tupolev, "that a jet passenger plane will carve out a path for itself and will be judged well." In our time, two-thirds of Aeroflot's passengers are carried on the gas turbine Tu-13s and Tu-154s created by the oldest OKB in the country.

The main aircraft designer A. A. Tupolev, conversing with a correspondent from IZVESTIYA on the eve of the sixtieth anniversary of the celebrated collective of airplane builders, noted that currently the efforts of the creators of winged liners are directed at creation of machines with increased efficiency and improved aerodynamic shapes.

Such a plane not only uses less valuable aviation fuel, but thanks to low-noise engines affects less severely the environment and the passengers in its cabins. It has more responsive and reliable controls, reliable radio navigation equipment and many "smart" electronic systems which, in part, permit pilots to receive all necessary flight information quickly and accurately. This will increase the regularity of flights and will make them more independent of any vicissitudes in the weather.

"Naturally, we also took care to provide greater comfort for the passengers," continued the aircraft designer. "The more comfortable cabin interior contemplated will have closing shelves for carry-on items and install roomy, more freely arranged seats for 180 persons."

This passenger plane, called the Tu-154M, has already been turned over to the test pilots who are preparing it for its debut in the large, hard-working family of "Tu" machines.

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MEASURES TO IMPROVE SERVICE TO TYUMEN TAKEN

Moscow TRUD in Russian 29 Sep 82 p 1

[Article: "To Work and Back by Plane. Responses to TRUD"]

[Text] This was the title of an article (TRUD, 8 June of this year) in which serious shortcomings were noted in the organization of air shuttle operations conveying on-duty brigades of oil workers flying to work from the European part of the country to the North Tyumen regions.

In accordance with instructions from the Presidium of the BTsSPS [All-union Central Council of Trade Unions], this article was discussed at a joint session of presidiums of central committees of trade unions of workers of the oil and gas industry, aviation workers and geological exploration workers, with the participation of management workers from the USSR Ministry of Civil Aviation, the Ministry of the Petroleum Industry, Ministry of the Gas Industry and the Ministry of Geology. Measures to improve organization of duty brigade shuttles and improve the efficiency of air transport utilization were developed and are implemented. In particular, a special schedule was arranged for shuttle flights. The "Instructions for Organization of Shuttle Flights on Air Transport" were approved by the Ministry of Civil Aviation.

Special dispatcher points were set up in the principal organizations of the Ministry of the Petroleum Industry, Ministry of the Gas Industry and the Ministry of Geology, to which organization of duty brigade transport was entrusted.

Facilities have been constructed for the duty brigades at the Nizhnevartovsk and Surgue airports and the "Granit" helicopter pad (Surgut rayon). Three dormitories for 120-200 men each were outfitted on the grounds of the Surgut airport through the efforts of drilling operation administrations of organizations of the Petroleum Industry Ministry.

Moreover, measures are being taken to accelerate putting into operation the air terminal at Nizhnevartovsk and the airport in the village of Noyabr'skiy, construction of the air terminal at Nefteyugansk and the hotel in Surgut, renovation of take-off-and-landing strips and the construction of helicopter pads and air parks.

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DEVELOPMENT OF AN-28 AIRCRAFT, SPECIFICATIONS DETAILED

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 10, Oct 82 pp 15-17

[Article by D.S. Kiva, deputy chief designer, candidate of technical sciences: "The An-28 Prior to Take-Off"]

[Text] Our journal has written about the primary characteristics of the An-28 aircraft, created by the collective of the Special Design Bureau (OKB), headed by General Designer O.K. Antonov. Work on improving the aircraft is continuing: Plant and state flight testing has been conducted, in the course of which specific design shortcomings were discovered and eliminated, and characteristics of the aircraft were improved. In this article, D.S. Kiva, deputy chief designer and candidate of technical sciences, tells the readers about those improvements which were made after the testing.

The An-28 was conceived as a multi-purpose aircraft, for transporting passengers, freight, mail along air routes, medical flights, conducting patrol duty and other functions. For this reason, during the course of flight testing, the test aircraft underwent an all-round check at different airfields (including unpaved, snow-covered, rain-soaked) and in different climatic zones. They were in Yakutsk, Mirnyy, Ust -Nera, Ashkhabad, Ternopol , on the islands of the Baltic Sea, in the mountains of the Caucasus, and in many other areas of our immense country.

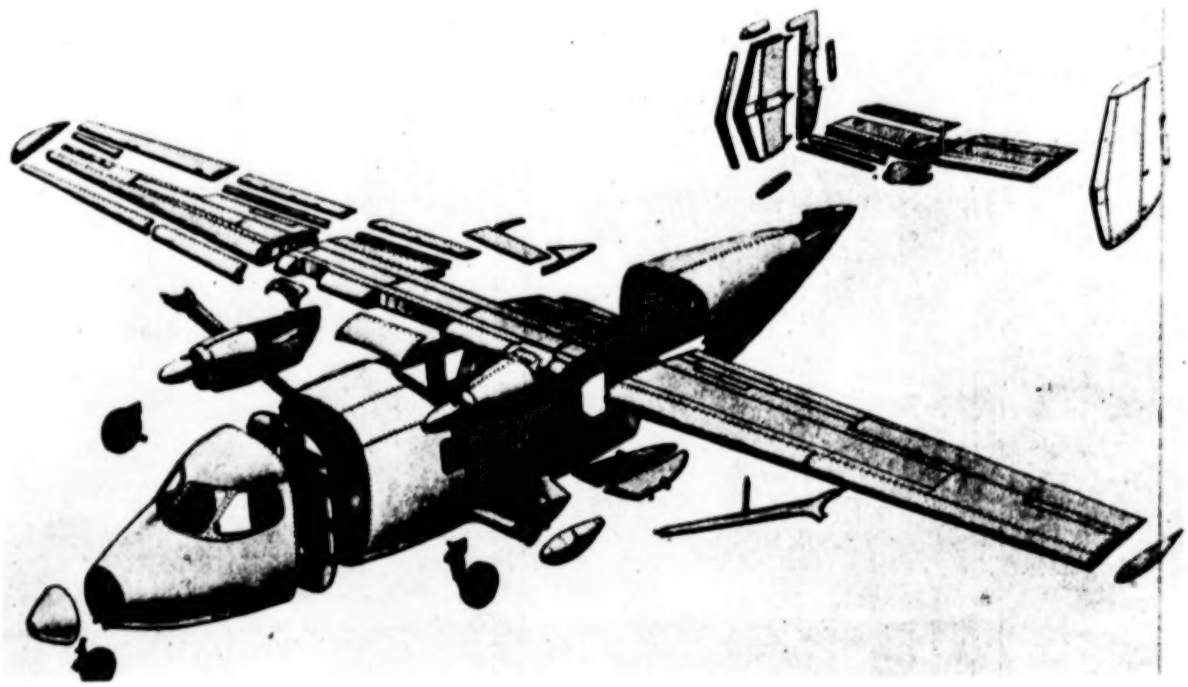
It should be noted that together with specialists of civil aviation, we were able to bring out additional capacity which allowed the flying weight of the aircraft to be increased by 500 kilograms (using practically the same length of runway). This will allow the cost of transportation to be lowered during operations.

In addition, the An-28 passed its certification, that is, an evaluation relative to the requirements of airworthiness. The work conducted toward this end with experts of the MGA [Ministry of Civil Aviation], the USSR Gosaviaregistr [State Aircraft Registry] and Minaviaprom [Ministry of Aviation Industry] produced exceedingly good results. Thus, every possible (and even low probability) situations, for example, those connected with the breakdown of some aircraft system was tested on stands, and the test aircraft

verified the probability of a safe flight. A broad spectrum of such situations was covered, including: Engine failure (one engine at every stage of the flight from take-off to landing, and both engines during horizontal flight); the engine and the automatic feathering system; both generators; both radio compasses; the radio compass and the course system; the pump system and the brakes of both wheels; the automatic flap and spoiler retraction system; and the automatic movement of the trimmers to their extreme positions. It was determined that in all cases specific failures would be discovered in time by the crew, and if recommendations were followed as to what to do in these cases, the failures could be successfully countered.

State tests confirmed the compliance of the aircraft characteristics with the standing technical requirements, and with regard to such parameters as the number of passengers and flight distance, the requirements were even surpassed. The experts concluded that the An-28 can replace the An-2 aircraft on local air routes, and using the same runways can achieve a higher degree of safety and flight regularity, a higher degree of transport productivity and greater comfort for passengers.

The achieved results became possible due to the application of the newest achievements of science and technology in aircraft design, the development of original design decisions (45 of them are recognized as inventions, with some of them being protected abroad), as well as a thorough follow-up refinement of hardware and systems. It is enough to say that from the time prototype development began, many changes were made. For example, a new type monocoque construction wing was designed and built, and practically all the pilot-navigational and radio communication equipment was updated.



TECHNOLOGICAL BREAKDOWN OF THE AN-28 AIRCRAFT

What, then, are the characteristic features in the design of the An-28 aircraft, considering all the modern improvements? Let us examine them briefly:

Airframe. The aircraft is high-winged. The fuselage is all-metal, semi-monocoque, with a functioning sheathing. Technically, it is divided into three sections: The nose, middle and tail.

The nose section has the crew cockpit, which is separated from the passenger compartment by a partition with a door. The passenger compartment takes up the center part of the fuselage. Here, single seats (on the left side) and double seats (on the right side) are installed for 17 passengers. Seat construction is such that they can be folded and placed against the fuselage walls, so that the aircraft can be used for transporting freight without any additional reequipping. The ceiling of the passenger compartment has two monorails for an on-board loading device with a weight lifting capacity of 500 kilograms.

The tail section has a freight compartment 2.4 x 1.4 meters, with mechanized doors and ramp. The tail section also has a folding baggage rack and a toilet.

The wing is very long and highly mechanized. It is sectional, and is divided into a center section and two detachable sections (outer sections). Wing construction is of the monocoque type. Part of the monocoque construction of the center section and the outer sections are in reality hermetically sealed fuel tank compartments. The wing is trapezoidal in shape, with a rectangular center section. There are braces, which transfer the load upon landing to the landing gear.

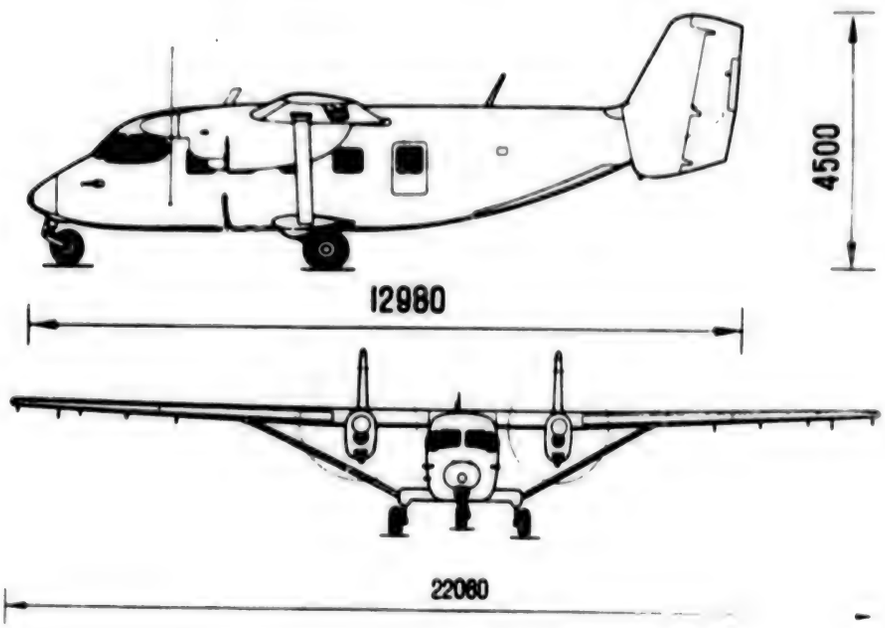
Along the center sections of the wing are automatic slats. The trailing edge of the wing has double-slotted flaps and hinged ailerons. The wingtips have small flaps for the mechanized decrease of banking (for decreasing banking if there is sudden engine failure on take-off). These flaps, together with wing root spoilers, are also used for braking when approaching for landings at airfields that have limited approaches.

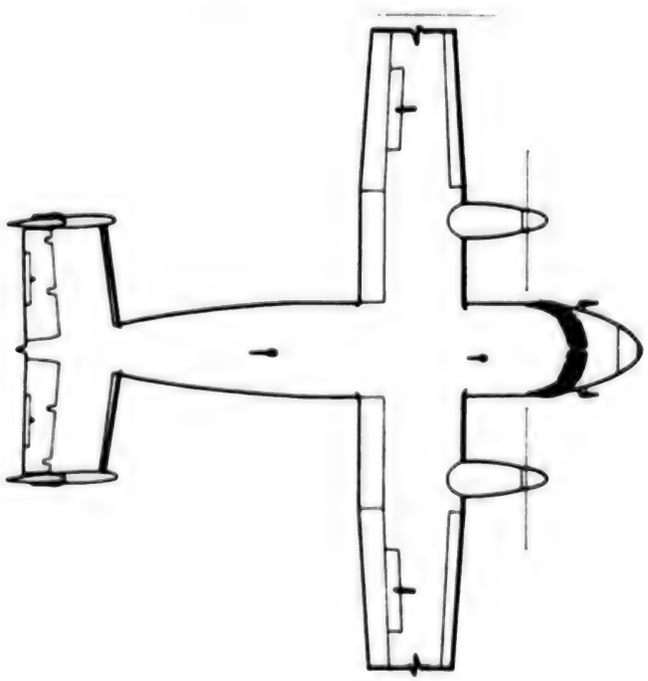
The tail assembly is cantilevered and twin-ruddered. The rudders are placed in the engine airstreams, which increases the efficiency of the tail assembly at low speeds. In addition, it was precisely this arrangement that made it possible to increase the size of the freight compartment.

In order to protect the leading edge of the stabilizer from icing and to improve stability characteristics during large negative angles of attack, there is an attached, inverted "slat."

The undercarriage of the An-28 is non-retractable, three-wheeled. The main landing gear is installed on a lower, small wing, which protects the wing and the tail assembly from dirt that might fly off the wheels. The front landing gear is equipped with an apparatus that fulfills the functions of a damper for lateral motion of the wheel and which allows the wheel to be steered.

The front landing gear has no brakes, but the main landing gear have one braking wheel each. The brake system permits joint or separate braking while taxiing and during the take-off run, as well as braking on the hardstand.





After the completion of state testing, the State Scientific Research Institute of Civil Aviation [GosNII GA] required that an automatic system assuring "non-skidding" rotation of wheels be installed on the primary wheels of the landing gear.

If necessary, the wheel landing gear may be changed to skis or pontoons.

The control system handles rudder errors, ailerons, flaps, spoilers, trim tabs and the front landing gear. There is dual control of elevators, rudders and ailerons; rudder and elevator trim tabs are electropulse controlled; and aileron trim tabs are electric. Spoilers are released by the hydraulic system and retracted by spring action. The spoiler control system works in two modes, manual and automatic.

The hydraulic system is used both for letting out and retracting flaps, wheel braking and controlling the turning of the front landing gear. It works from the power pack with an electric drive. Plugged into the system is the hydraulic accumulator, which prevents the power pack from being turned on often, and which ensures that the spoilers and braking system will work if they fail to function.

The power plant of the aircraft consists of two TVD-10B engines having AV-24AN propellers and systems that ensure the operation of the engines and airframe systems (fuel, oil, engine exhaust, control and regulating, power system control, etc.).

The engine is twin-shaft, with a free turbine. It consists of a compressor, combustion chamber, compressor turbines, power (free) turbine, high-speed reduction gear, transmission, propeller reduction gear and control housings for the aircraft assemblies.

The compressor is a mixed-flow type, with six axial stages and one centrifugal stage. The degree to which pressure is raised under static conditions, at 29,600 revolutions per minute is 7.4.

The combustion chamber is annular, with a centrifugal, rotating nozzle and two ignition devices.

The compressor turbine is two-stage axial.

The power turbine is one-stage axial. It powers the propeller and aircraft assemblies.

The high-speed reduction gear, together with the propeller reduction gear, is designed to transmit torque from the power turbine to the propeller.

The engine is equipped with safety systems: anti-icing, fire extinguishing, protection of the power turbine from excessive speed (it provides for automatic stop and feathering of the propeller upon reaching the maximum rotation limit), automatic feathering of the propelller in case of engine failure and a centrifugal decelerator for the propeller speed.

The air propeller is three-bladed (diameter 2,800 mm), automatic and reversible. Its mode of operation is direct (single action), from idle thrust to the take-off mode, and double action from a maximum thrust flight [PMT] to reverse. The regulating and controlling system for the propeller group is of the hydraulic-electrical type. It provides for automatic control in setting the blades in the PMT take-off zone and manual pitch control, depending upon fuel consumption in the PMT reverse zone, as well as automatic and mandatory propeller blade feathering.

Due to the active reversal of propellers, the aircraft can move in reverse.

The aircraft's fuel system consists of monocoque construction tanks, drainage system, fuel supply lines and fuel discharge lines. The fuel is contained in four monocoque construction tanks (two in each half wing). Also installed there are centrifugal and jet pumps, fuel-measuring gauges and valves for discharging the condensate.

The drainage systems are symmetrically installed in the half wings. Safety vacuum valves are installed in them.

Fuel discharge from the tanks is accomplished with pumps or through gravity flow. Spigots for the fuel discharge are located in the engine nacelles.

The fuel supply system consists of lines for pumping and transfer pumping. The pumping main lines to the engines have pumps installed in the fuel tank outlet sections, reverse valves and shut-off valves. Jet pumps are used for transfer pumping the fuel into the tank outlet sections and for maintaining the required level of fuel in the outlet sections of the fuel tanks.

On-board systems. A heated air anti-icing system has been installed for protection against the icing of the leading edges of the wings, the horizontal and vertical tail sections, and the air intakes. It uses hot air that is diverted from the compressors of both engines.

The engine air intakes are continuously heated by oil (coming from the engines), since their internal housing serves as oil tanks.

The propeller blades and cones, the air velocity tubes and the front windshields in the cockpit are all electrically heated. The windshields have electric windshield wipers.

Hot air for heating the compartments comes from the engine compressors and first goes to the mixer where cold ambient air is added. In the heating mode, the required temperature is maintained automatically. Individual ventilation has also been included.

The aircraft's electrical system supplies the users with an alternating three-phase current of 200/115 volts from two generators with a 16 kilowatt capacity, an alternating three-phase current of 36 volts obtained from two transformers, each having a one-kilowatt capacity, and a direct current of 27 volts, obtained from static semi-conductor rectifiers with each having a power of 6 kilowatts. For an emergency source of electrical energy, there are two calcium-nickel accumulator batteries, each rated at 25 ampere hours.

The electrical supply system is divided into two completely independent subsystems for the left and right sides. It has been planned for 100 percent utilization of power and an automatic switch-over from sources or lines that have failed to those that are operational. The blocking system eliminates undesirable effects if servicing personnel do something wrong.

Lighting equipment has been designed for illumination and for signal lights. The cockpit, passenger compartment, panels, switchboards, instrument panels and the instruments themselves are all illuminated. The general lighting of the cockpit comes from one ceiling fixture, while the panels, switchboards, and instrument panels are lit by lamps.

The passenger compartment is illuminated by 12 light fixtures.

Headlights are used to illuminate the runway. An internal signal system (with the aid of a display board) allows one to determine the status of aircraft systems. The external signalling devices include two pulse beacons and navigational lights.

Radio communications equipment includes a loudspeaker system (for communications between crew members, for speaking to passengers and for switching radio-receiver communications over to crew members' earphones), a "Baklan-5" ultrashortwave radio transmitter (for communications with other aircraft and ground radio stations) and emergency ultrashortwave radio transmitters.

Navigational and loading equipment includes radio apparatus for determining course angles (for homing in on radio stations and radio beacons and determining the position of the aircraft), a warning radio receiver (for determining the moment the aircraft flies over operating ground warning radio beacons) and a radio altimeter for low altitudes.

On board there is the latest piloting and navigational equipmemt necessary for piloting the aircraft, for controlling the altitude of the aircraft in space, and for navigation.

PRINCIPAL AIRCRAFT CHARACTERISTICS

Commercial load, kilograns	1,750
Number of passengers	17
Cruising speed, kilometers/hour	350
Flight range at cruising speed (with a commercial load of 1,500 kg and fuel reserve for a 30-minute flight), kilometers	800
Maximum flight range (with a commercial load of 1,000 kg and fuel reserve for a 30-minute flight), kilometers	1,365
Required runway length (with atmospheric conditions, R = 730 mm of mercury, t = + 30 degrees C), meters	580
Relative firmness of unpaved operational area, kilograms/square cm	3.5
Landing distance (from height of 15 meters), meters	360
Take-off distance (to height of 10.7 meters), meters	395
Speed for landing approach, kilometers/hour	130

BRIEFS

NEW ARMENIAN AIRPORT--Leininakan, the second largest city and the cultural center in the Armenian SSR, now has a new airport. The new airport's capacity is six times that of the old airport. Passenger aircraft from the Armenian SSR have scheduled flights to other Soviet cities and to Eastern and Western European countries as well as to Lebanon. [Text] [GF150/32 Baku International Service in Azeri 1300 GMT 14 Dec 82]

CSO: 1831/3

MOTOR VEHICLE

AUTOMOTIVE MINISTRY OFFICIAL ON MAINTENANCE FOR PRIVATE VEHICLES

LD180422 Moscow Domestic Service in Russian 1900 GMT 17 Dec 82

[Interview with Yuriy Aleksandrovich Maksimov, deputy chief of the All-Union Technical Maintenance of Privately-Owned Automobiles Industrial Association of the Ministry of the Automotive Industry, by an unidentified interviewer; place not given; live or recorded]

[Text] [Question] The CPSU Central Committee Politburo has considered a proposal on measures to further develop the network of enterprises for the technical maintenance of privately-owned cars and for increasing the production of spare parts for them. At the microphone is Yuriy Aleksandrovich Maksimov, deputy chief of the All-Union Technical Maintenance of Privately-Owned Automobiles Industrial Association [Soyuzavtotekhobaluzhivaniye] of the Ministry of the Automotive Industry.

[Answer] Every year, the number of cars belonging to citizens rises by 800-850,000. In 1985, 50 million people will be directly affected by this problem. Unfortunately, the growth in the number of cars is running ahead of the capacities for car servicing. This field is a comparatively young one in our country. Its development and production capacity are not keeping pace with the output of cars. In the years 1983-87, 200 car service stations will be set up throughout the country. Operated by the USSR Ministry of Transport, these stations will be prefabricated structures, with complete up-to-date equipment. They will be built in densely populated areas.

To solve the spare parts problem, the Ministry of the Automotive Industry will have to build a number of repair works. The Gorkiy Motor Vehicle Works, the Lenin Komsomol Works and the Zaporozhye Motor Vehicle Works will build these works and participate in reconditioning units. By 1987, we shall be reconditioning 161 million spare parts. This will enable a great quantity of metal to be saved which can be used for producing more spare parts.

[Question] Recently, car servicing by a manufacturer's agent [firmennyy avtoservis] is becoming more widespread where the automobile factories build their own service stations. Is this the pattern for the future building of stations, or will they cover a wider range?

[Answer] The point is that we obviously cannot build manufacturer's agency service networks throughout the country, because we have some remote areas where general service stations, which are capable of repairing all models of vehicles, have to be set up. But at the same time, we are pursuing a trend of developing the manufacturer's agency system of servicing vehicles. As an example, one may quote the VAZ [Volga Motor Vehicle Works] system. The Moscow Motor Vehicle Works system is also developing successfully, as is the Zaporozhye one.

CSO: 1829/89

FIRST DEPUTY RAILWAY MINISTERS' DUTIES CLARIFIED

Moscow GUDOK in Russian 6 Jan 83 p 2

[Unattributed report published under the rubric "Official Section": "On the Distribution of Responsibilities Between the First Deputy Railway Ministers"]

[Text] The minister has established the distribution of responsibilities between the first deputy ministers of railways:

V. N. Gin'ko directs the exploitation of the railways and interbranch industrial rail transport in the fulfillment of plan assignments for the shipment of freight on the basis of effective use of technical means. He oversees the management of operations, the planning of freight transport and its coordination with the production plans of other ministries and departments, the maintenance of target rates of train traffic on the rail network, and the provision of transportation support for the agro-industrial complex.

He directs freight and revenue earning traffic, containerized and packaged hauling, the organization of prompt unloading of cars, and matters relating to the safeguarding of freight.

Directly subordinate to Gin'ko are the Main Administration of Railway Traffic, the Main Administration of Freight, the Main Administration of Containerized and Packaged Transport and Mechanization of Loading-Unloading Operations [Glavnoye upravleniye konteynernykh i paketnykh perevozok i mekhanizatsii pogruzochno-razgruzochnykh rabot], the Administration of Statistical Accounting and Reporting, and the Administration of Armed Security [Upravleniye voyenizirovannoy okhrany].

He coordinates the work of the deputy ministers and the main administrations for matters regarding the utilization of technical means in the organization of freightage.

F. I. Shuleshko implements the general direction of the Ministry of Railways' production-economic activity: construction and repair of fixed productive capital; introduction of new technology; implementation of a uniform technical policy; and improvement of the work of industrial enterprises, particularly of

plants for rolling stock repair and spare part production. He oversees matters relating to the comprehensive development of all sectors of railway transport and the maintenance of the necessary balance among all sections of the network, improvement of maintenance operations, enhancement of rail transport management, and both material-technical and labor supply.

Directly subordinate to Shuleshko are the Main Passenger Administration, the Main Administration of Worker Supply, the Chief Inspector of Traffic Safety, and the Organizational and Personnel Department.

Concerning matters of production and economic activity, he coordinates the work of the deputy ministers and the Ministry of Railways administrations, particularly the following Main Administrations: Locomotives, Railroad Cars, Lines, Electrification and Power Resources, Capital Construction, Material and Technical Supply, and Signals and Communications.

CSO: 1829/88

'TURKSIB' RAILROAD PROGRESS, PROBLEMS

Sayak-Aktogay Line Completion

Ashkhabad TURKMENSKAYA ISKRA in Russian 24 Aug 82 p 2

[Article by V. Kushnir, foreman of a track-fitter crew from the "Kazaktransstroy" [Kazakh Transportation Construction] Trust: "The Turksib [Turkestan-Siberian Railroad]: Is Biography Continues"]

[Text] Once again we transportation construction workers have come to the legendary Turkestan-Siberian Railroad, which was begun during the First Five-Year Plan. Our track laying began between the settlements of Sayak and Aktogay. Now the rapidly developing industry of the south-east section of the republic will be connected by the shortest route with the Urals and central regions of the country.

At first glance, against the background of enormous construction projects this seems to be an ordinary event. After all, the new main line is only about 200 kilometers in length. But it is not for nothing that people say: "a gold coin is small, but precious". The future line will play a major role in further strengthening Kazakhstan's economy. The Balkhash Mining and Metallurgy Combine will gain access to the Aydarlinskiy copper ore fields.

Our crew gave D. Asylbekov, a distinguished construction worker, the right to lay the first rail. A Turksib veteran and an honorary member of our crew, Asylbekosov often told us how workers, sent from all the fraternal union republics, labored with great enthusiasm to build the roadbed 50 years ago. The main line, 1,500 kilometers in length, initiated the industrialization of the vast expanses between the Ural and Irtysh rivers and went into operation 1 year ahead of schedule. It is our duty to be worthy successors of the heroic labor feats of the first five-year plans. That is why we decided to turn the railroad over to the operational workers next year--ahead of schedule.

We will fulfill our promise. Overfulfilling the daily norm has become a rule for the crew. It isn't easy to do: our plans are intensive. We are aided by our knowledge of related skills, skillful use of equipment, the great effectiveness of socialist competition, and the workers know-how.

We are glad to see the results of our labor: work trains have already travelled on the first section of track and we are getting ready to put the second section into operation. Thus, the traditions of the Turksib's first builders have been passed on to trustworthy hands.

Day and night, trains travel on the main line, carrying food, coal and metal from Kazakhstan, cotton from Uzbekistan and lumber from Siberia. The main line operates at an intense pace and its construction continues. (TASS)

Semipalatinsk Area Defects Continue

Moscow GUDOK in Russian 3 Nov 82 p 2

[Article by special GUDOK correspondents V. Kurkov and G. Isakov, reporting from Alma-Ata, Semipalatinsk and Barnaul: "The Turksib: Barriers in the Way of Trains. GUDOK's Observation Posts on Critical Lines. Let's Give Traffic a Precise Work Rhythm!"]

> [Text] The Turksib was one of the remarkable construction projects during the first five-year plans. This line did a great deal to aid the rapid development of Siberia, Kazakhstan and Central Asia. Even today, in celebrating its 50th anniversary, the Turksib has not lost its economic importance. Moreover, the demands on this main line are constantly increasing.
>
> During all these years, the Turksib has been developing. Diesel engines replaced steam engines long ago; the tracks support high speeds; automatic block signalling and centralized traffic control make it possible to regulate train traffic efficiently. Yet, in recent years there has been ever more frequent discussion about traffic organization--which has not been the best, to put it mildly--the constant interruptions in the flow of traffic and about many problems of today's Turksib*

During the past two decades, more than 30 million rubles have been spent in developing the northern section of the Turksib, which runs along the Altay Division of the West Siberian railroad. Considerable funds have also been spent to renovate the Semipalatinsk Division of Alma-Ata Railroad. However, there are continued traffic jams at the junction of the adjacent railroads in Lokot'. True, there are almost no problems with train traffic from south to north; but, from north to south there are quite a few problems.

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*This is the second of two articles. See the 2 November issue of GUDOK for the first article.

More than once, GUDOK was published alarming news from this "sore spot" of the Turksib. It would seem that the managers of the Altay and Semipalatinsk divisions are taking measures to establish a smooth flow of traffic. The Lokot' Junction is under constant monitoring, both by the managers of the adjacent railroads and by the main administrations of the ministries.

Whether because the measures taken were not completely worked out, or because the fine words and documents are not supported by effective actions, or because the adjacent railroads are more interested in organizational measures than in reinforcing the material base, matters on the Turksib are getting worse and worse. Many facts lead one to such a conclusion. We will cite only a few of them.

In 1980, a new line--from Malinovoye Ozero--ran from the north to Lokot'. The Lokot' Station became an important junction, but there was no development connected with this construction. The minimal facilities provided for in the plan--additional tracks, centralized control of switches and signals, living quarters for junction officials and other buildings--are to this day among the unfinished projects. At Lokot', an organizing or rather disorganizing problem was added to the usual numerous problems of new construction. The West Siberian Railroad is the contractor here, the Altay trust of the USSR Ministry of Transportation Construction is conducting the work, but the station itself belongs to the Alma-Ata Railroad.

K.Aymagambetov has managed the station for 10 years. He tells how 3 or 4 years ago, there were almost 1 and 1/2 times as many trains passing through Lokot' from north to south as pass through today. He also tells how the year before last he saw, for the first time in his life, a rail token system--the new construction at Lokot' had arrived with a "token". In other words, not only had the difficulties increased, but the amount of traffic had decreased.

The engineers at Rubtsovsk Deport on the West Siberian Railroad, who drive trains as far as Semipalatinsk, are also working less effectively. Overtime payments per engineer are now 1 and 1/2 times greater than during last year. The number of violations of continuous operation procedures since the start of the year is approaching 2,000, which is three times as high as last year's level.

This list could be continued. Technical difficulties are caused by uneven development of facilities, the unsatisfactory condition of diesel, engines, the low degree of car preparation for a trip, plus poor maintenance facilities, both among the Siberian and the Alma-Ata railroad workers. These difficulties are compounded by worthless planning, lack of executive discipline, feuds at every level, unconcealed deception of each other, and so forth.

The number of "abandoned" routes, not accepted by the Semipalatinsk Division, varies from 10 to 15, reaching 30 on individual days and sometimes even more than 30. The Altay controllers blame everything on the neighboring Semipalatinsk workers. They say that these neighbors don't even accept the number of trains which they themselves agree upon the day before. For many

years in succession, the Semipalatinsk workers have been "capturing" the diesel engines of the West Siberian Railroad and operating them as unassigned tractive levers. As a rule, the Alma-Ata railroad workers are now holding on their track sections twice as many locomotives from the West Siberian Railroad than is permitted by the traffic schedule.

However, it would be incorrect to say that the Semipalatinsk workers are artifically creating favorable conditions for themselves at the expense of their neighbors. The "wave of non-acceptance" rolls farther along the Turksib to Aktogay, the junction of the Semipalatinsk and Alma-Ata divisions, and from there to the junction with the Chuyskiy Division, and so forth. We saw trains destined for stations of the Alma-Ata Railroad and trains in transit to the Central Asian Railroad, standing without locomotives, on controllers' schedules and in the open air at a majority of the stations along this route.

In such complex conditions, it is especially important that there be mutual understanding between the locomotive workers and the traffic managers, plus cooperation between the engineers and the controllers. Unfortunately, there is not a trace of any of this on the Turksib now. The traffic managers perform their difficult job, moving trains as though the locomotives were controlled by automatons, about which one needn't worry that they might get tired, that they might need to get something to eat somewhere, that they have families.

Here are some facts which enable one to judge how the trains advance. On 17 September, engineer B. Ivanov travelled 14 kilometers of track in 10 hours. He called for a shift change and L. Medved' relieved Ivanov. In 14 hours, Medved' travelled 13 kilometers. He also requested a shift-change and was relieved by that same B. Ivanov, who had gotten his normal 12-hour rest between trips. On the next trip, L. Medved' set the "record for the month" by staying on the job for 20 hours non-stop! Within a day, the "record" was broken--engineer A. Kreps stayed on his diesel engine for 24 hours and 35 minutes!

But now, there are other problems--crews have begun being assigned to diesel engines and locomotives are being transferred to work as shortened means of traction. Four or five sorts of diesel engines are being gathered at individual junctions to be assigned to the newly opened mini-depots at Charsk Station and at Matay, and for crew assignment. All of these things further complicate an already complicated train situation. It was decided on the Alma-Alta Railroad to try this experiment again, under duress, so to speak.

The percentage of diesel engines which are out of order on the railroad is almost double the norm. For example, in September, as many as 50 diesel engines per day failed to leave for their trips. That is enough engines to fill a medium-sized depot! In the Semipalatinsk-Chu sector, up to 70 percent of the locomotives are "out of circulation", not hauling cars to the separation point as prescribed by the schedule.

One can hardly explain the present disastrous situation by referring to design deficiencies in the diesel engines. The Altay Division of the West Siberian Railroad and the Turksib line switched almost simultaneously from steam to

to diesel locomotives 25 years ago. The West Siberian Railroad workers are still using the TE3 [diesel locomotive with electric drive] engines which they received a quarter of a century ago. These engines somehow manage to move the trains to Lokot' for exchange, plus they handle the flow of traffic in the opposite direction without any particular problems. However, the workers raise the issue: the diesel engines are worn out and must be replaced. Yet, on the Alma-Ata Railroad, the TE3s were replaced by new more powerful 2TE10L, then by 2TE10V locomotives, but traffic was not improved.

Yes, the engineers have many complaints about the new diesel engines. GUDOK has reported the substance of these complaints many times. The climatic peculiarities of Kazakhstan also have a telling effect: when the air temperature reaches 40 degrees during the summer, the 2TE10Vs overheat. Nevertheless, there are depots and entire main lines on the rail network where those same locomotive operate in good order. And it is well known, why this is so. It is the result of high-quality maintenance facilities, high skill levels among metal workers and engineers, plus good cooperation with traffic managers.

Our conversation with R.Mukhamadiyev, chief of the Alma-Ata Division, was instructuve. We talked about that very problem--diesel engines. Here is what was said:

"Ideally, we operational workers shouldn't be concerned with such details as methods for maintaining and repairing locomotives; controllers have enough worries of their own. Diesel and electric locomotives were created for large areas, heavy trains and high speeds. The splitting up of tractive resources and the assigned-crew method for servicing locomotives binds a traffic manager, hand and foot. That is obviously a negative feature. And you can see specific examples of such constraints right now at any controller's group. However, we were forced to adopt these complicated methods, again for the sake of traffic. Even the present incomplete consolidation is equivalent to adding 5-6 diesel engines to the line. We have still not compared or calculated whether there are more positive or negative features in this matter. However, when you are faced with the problem of whether, as they say, to move or stand, you try all kinds of experiments. We know the way out of the present situation: we must develop repair facilities at the basic large depots. But the neglect of 10-20 years cannot be quickly rectified."

Everything [in the situation] has been laid out--there's nothing to be added or subtracted. Assigning crews to diesel engines is already causing not only additional difficulties together with a temporary insignificant improvement in traffic, but also new disagreements between traffic managers and locomotive workers.

A.Bekker, an engineer at the newly opened "small" depot at Charsk Station, wrote a report to his chiefs in Semipalatinsk about how the duty officer at Zharma Station, together with the train controller, "needlessly" took away Bekker's diesel engine and let it go through to an unassigned lever.

Bekker further adds: "Wasn't that an insult! I had spent the entire previous day in preventive maintenance rubbing and scrubbing the engine, then they took it away from me."

The diesel engine was "taken" away from the engineer not without some fraying of nerves for the station's duty officer resorted to open deception and declared that he was acting in accord with an order from the chief of the railroad. Nothing less than that!

Take note of what the engineer was doing to the diesel engine during its preventive maintenance--he was "rubbing and scrubbing". This is because the train's crew will still not perform major repairs. Such repairs must be done at a depot with the proper equipment and skilled metal workers.

It would hardly be proper for us to prescribe the method for getting out of the current clearly critical situation on the Turksib. There are specialists and managers for that. However, here is something we want to caution against: in solving the locomotive problem, one mustn't forget about all the other problems. Not everything is going smoothly in many other critical sectors. In particular, there are problems with development of section stations. Some places are not fully staffed. Problems of housing, children's institutions, commercial enterprises and public catering are "overlooked", due to the attention being focused on personnel. And so on and so forth; there are many problems. All the problems are now being overshadowed by a single problem--diesel locomotives.

To view one's facilities as a whole is the special art of a manager. In complex situations, special significance is attached to well thoughtout planning of operations, a high degree of executive discipline, and good relations with those working at one's side. The technical and production problems on the Alma-Ata Railroad could be resolved with fewer losses, if there were a basis for such a resolution, in the form of a clear and realistic comprehensive plan. The main administrations of the Ministry of Railways have been called upon to assist the new management of the railroad in drawing up such a plan and subsequently to implement it.

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TBILISI ELECTRIC LOCOMOTIVE PLANT: ACCOMPLISHMENTS, PLANS

Moscow ELEKTRICHESKAYA I TEPLOVOZNAYA TYAGA in Russian, No 11, Nov 82, pp 5-9

[Article by Z.D. Chivadze, general director of the Tbilisi "Elektrovozostroitel'" Production Association: "Achievements and Plans of the Tbilisi Electric Locomotive Builders"]

[Excerpt] Creating the New and Improving What Has Been Implemented

In order to accelerate technical progress in the area of electric locomotive construction, a Special Project Design Bureau (SPKB) was organized at our plant back in 1958, which was given the task of developing a new type eight-axle [sixteen-wheel] freight locomotive. The first electric locomotive of the VL 10 series was produced in 1961, and subsequently its serial production was implemented. Beginning in 1976, the plant began producing the replacement for the VL 10, the VL 10U, with a load factor of 25 tons per axle.

The designers' collective also created the VL 8V-001 electric locomotive, the first one in the world with an impulse regulator, which works on 3-6 kw of direct current in the contact net. After this, five electric locomotives of the VL 22 series were modernized for use at six kw of power; they underwent their operational testing in the Gori-Tskhinvali segment. It turned out that these electric locomotives have higher traction properties. On the basis of the experience gained, it is being proposed that work be done in the future on creating electric rolling stock that would work on a direct current of 3 kw and have an impulse voltage regulator.

In order to increase the flow-through capacity of electrified railroads using direct current, the SPKB and plant collectives designed a new mainline freight electric locomotive in the mid-1970's, the VL 11, and assimilated it into serial production. These machines are produced as two-section locomotives; if necessary, the locomotives can be formed from three or four sections. They are controlled by a multiple unit system. In a three-section hookup, the electric locomotive is capable of pulling a train weighing up to 10,000 tons, which significantly increases the flow-through capability of railroads and lowers operational costs. The national economy savings resulting from the use of one three-section locomotive increase by 80,000 rubles per year.

The VL 11 electric locomotive is worthy of the state Quality Badge. For the first time in domestic operations, the VL 11 has been equipped with a diode junction, which prevents a sharp decrease ("failure") in traction power when traction engines are being reconnected. The electric locomotive can start moving from a standstill position by using four engines hooked up in a series (instead of eight and six on other machines). Electronic devices have also been installed, which ensure parallel work of control generators for a common load. This conserves the power both to the control circuit and the charge to the storage batteries many times over. Remote switching off of damaged traction engines and collection of emergency data without stopping the electric locomotive have been incorporated into the design. Because of this, the probability of a train stopping on a mainline because of an emergency has been decreased.

Among other innovations that have been incorporated are: A new pneumatic brake system, which ensures greater traffic safety for trains; a motor power relay, which prevents dangerous voltage surges in the power circuit when the regenerative braking system is switched off; a signal system that informs the engineer about how the different sections of the electric locomotive are working, as well as in which section and where an emergency situation has occurred; and a modern housing for a centrifugal exhaust, which increases efficiency by about 10 percent.

In addition, it was possible to decrease the amount by which traction force is increased in different positions during acceleration. This facilitates an improvement in its traction properties (an increase in traction force in different positions of a three-section hookup is lower than on the two-section VL 10 electric locomotive, and does not exceed a force of 10 tons).

The VL 11 electric locomotive also has a number of deficiencies. The plant is continuing work to eliminate them.

The plant project design bureau is devoting a great deal of attention to further improving the construction of serially produced electric locomotives. Recently a system has been installed on them that ensures an automatic removal of traction and a sand-feed in speeds of up to 10 km per hour, in case where there is emergency braking. There is a system that allows a simultaneous operation of electric and preumatic brakes, when the pressure in the brake cylinders does not exceed 1.5 kg per square centimeter. A new remote control panel, the PU-037, has been istalled. In the TL-2K1 armature winding, a film-glass-mica-fiber moisture resistant insulation of the type GIP-LSP-P1(V)-0.45 is used, instead of the GFS-05 micanite. In place of a blast signal and whistle, there is a new sound signal, a type TS-15 siren.

To facilitate servicing, the storage battery has been moved under the hood from the engine compartment of the electric locomotive. Better systems have been designed, such as regenerative braking (only at high exhaust fan speeds) and anti-unloading devices during pneumatic braking. The engineer's compartment has been lengthened.

At the present time, work is being conducted on introducing a static converter for supplying field windings of traction motors during regenerative

braking, in place of the rotating converter of the System for Automatic Control of Regenerative Braking (SAURT). Work is also proceeding on an improved control system for an anti-slipping safeguard and for equipping the electric locomotive with an adsorption device for eliminating condensation from the pneumatic conduit. There is work being done as well on improving the BVZ-10 quick response switch, which is to replace the BVZ 10-A; and other work is also being done. All these efforts will increase the reliability of the locomotive and will ease the work of the locomotive engineer.

It should be stated that the plant output is not limited to only mainline electric locomotives. The collective has also taken on the production of industrial coke-slaking electric locomotives and electric stock-piling machines.

The Tbilisi Electric Locomotive Construction Plant imeni V.I. Lenin has become the main enterprise of the "Elektrovozostroitel" Production Association that was founded several years ago. The Association includes the Tbilisi and Akhaltsikhe electric engine plants and the Special Planning and Design Bureau.

By a decree of the Presidium of the USSR Supreme Soviet, dated February 16, 1976, the plant was awarded the Order of the Laboring Red Banner for organizing the production of powerful mainline and industrial electric locomotives and high capacity electric stock-piling machines, and for fulfilling the tasks of the 9th Five-Year Plan ahead of time.

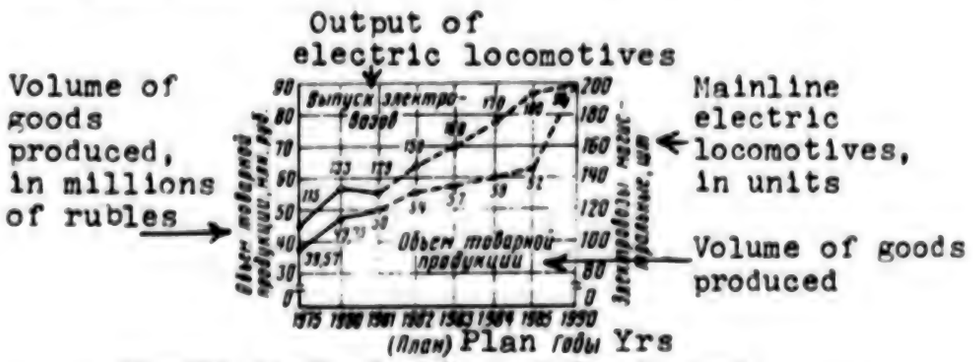
"The Basic Directions of the Economic and Social Development of the USSR for the Years 1981-1985 and for the Period up to 1990" include planning for a 14-15 % future increase in railroad freight turnover and a 9 % increase in the turnover of passenger traffic. One of the most effective ways of accomplishing this task is to increase the speed and weight of trains, which can be achieved by a corresponding increase in the power and tractive force of locomotives.

Two years ago the plant was given the task of developing and producing 12-axle [24-wheel] electric freight locomotives that run on direct current. Serial production is planned for the beginning of 1986. Planning the construction in accordance with the design schematic that we developed, we have made provisions to use the new TL-3 traction engine with a power of 750 kilowatts and a system of automatic control in a regenerative operation based on the SAURT.

In connection with increasing the power of the electric locomotive up to 9,000 kilowatts, there is the task of mastering the production of new traction engines and auxiliary machines, as well as replacing nearly all start-control apparatus. In doing this, it is planned to make the maximum possible adaptation of apparatus for electric locomotives using alternating current. Obviously, preparation for the production of the new machines will require work on a very large scale. The initial output of electric locomotives is supposed to be produced two years before the beginning of serial production. This will permit experimental operations, on the basis of which the final design will be made.

Concern About Quality

The Tbilisi locomotive builders have established close contacts with the depots which use our electric locomotives. A business-like relationship helps us to more fully consider the comments of railroad line workers and to improve constantly the design of units and assemblies, and to improve the reliability and durability of electric locomotives. On our part, we try to assist the depot workers in mastering, operating and repairing the new equipment, and we send our experts there for consultations with locomotive teams, masters and workers. With the goal of training them in the most efficient and effective ways and methods of equipment maintenance, we have organized special service groups, the first ones in the Sverdlovsk-Sortirovochnyy and Perm'-Sortirovochnyy depots. They also help in eliminating unexpected breakdowns, compiling data and then informing the plant designers about them.



Growth in Production of Goods and Output of Electric Locomotives for 1975 - 1990

Using the example of auto servicing, we established our own warehouses in the Belovo, Sverdlovsk-Sortirovochnyy, Perm'-Sortirovochnyy and the Penza III depots, where we stored various assemblies and spare parts for electric locomotives. We believe this is a good move, although, to tell the truth, in connection with the reconstruction, the plant does not always have the capability of fully satisfying all the depots' needs.

The Comprehensive System for Quality Control (KSUKP) established during the 10th Five-Year Plan, facilitated a significant improvement in qualitative indicators in the work done by shops and association subunits. The standards of the enterprise comprise the basis of the organizational-methodological system. Thus far, 72 such standards have been developed. They embrace all stages of the production cycle, from research, planning and preparation to manufacture of components and production output, to delivery, initial operation and utilization.

Subsystems of the KSUKP are the Defect-Free Product Manufacturing System and production delivery to the OTK [Technical Control Section] organization with the first output (the BIP system). Its component element is the material and moral motivation of workers who fulfill their tasks without defects. The functioning of the BIP system increased the sense of responsibility of every worker for the quality of the work done by him.

Workers who regularly deliver the produced item from its initial run are awarded an OTK certificate with an official seal and a medal, "Outstanding Quality Worker." Workers who receive this have the right of self-supervision. As of now, 150 persons have earned this distinguished right.

A component of KSUKP was incorporated: The Single System for the Technological Preparation of Production (YeSTPP). During the process of incorporating this system, 1,300 specific parts were transferred for manufacture in accordance with standard technological processes. The application of universal and standard readjusted retooling has been broadened.

One of the most important indicators showing the effectiveness of introducing KSUKP is the increase in the ratio of manufactured machines having the state Quality Badge. At this time, three types of products have earned the meritorious five-sided badge: The VL 11 mainline electric locomotive, the EK 14 industrial electric locomotive and the ESh 188 electric stock-piling machine. The number of products having a Quality Badge comprises 45 % of the total output.

The shops in our plant are laid out in spacious, light buildings and are provided with modern specialized and unique equipment. The introduction of new machinery, the mastery of technology and the organization of labor ensure the high quality, reliability and durability of manufactured output. Widely used are automatic and semi-automatic welding, special stands, tilting devices and signaling keys, universal assembly devices, synthetic diamonds, etc., and powder metallurgy parts are also used.

The collective devotes a great deal of attention to mechanizing and automating work processes, which in the near future will reach 65 % for primary production, up to 61.3 % in secondary production and up to 70.8 % in intermediate production.

To improve the production process, the plant has introduced a progressive system of continuous operational planning, which is the basis for organizing evenly paced work at the enterprise. In the process of improving this system, an automated system for control (ASU) was developed and put into operation for the plant, using third generation computers.

At present, with the aid of ASU, the most important problem on production and economic activities are being resolved, such as: Technical preparation for production, operational planning and direction of primary production, control of material-technical supply, technical and economic control and control of marketing and sales. In addition, there is coordinated work of the "automated data bank" subsystems.

Creativity, Research and Projects

The life of the plant collective is rich with many examples of creative research and initiative. At the suggestion of workers in the welding and assembly shop, several years ago our plant organized the first consolidated

joint brigade. It is headed by a cadre worker, communist Amiran Gelashvili, now a laureate of the USSR State Prize. This positive initiative has been supported by the other shops.

The establishment of these consolidated joint brigades has increased the workers' collective responsibility for accomplishing production tasks and has made possible the growth of productive labor. It has decreased losses in working time and has improved the utilization of equipment. There have been perceptible results in people helping each other and replacing each other, in placing strict demands upon one's self and one's comrades, all based on a communality of interests.

Competing to be worthy of celebrating the 60th anniversary of the formation of the USSR, the workers of our production association have begun a work duty watch in order to complete successfully the second year plan of the 11th Five-Year Plan. They reexamined their capabilities and decided to exceed the plan, fulfill their requirements ahead of time and additionally, this year, to produce and sell 450,000 rubles worth of goods, increase labor productivity by 0.3 % and make no less than an additional 50,000 rubles profit.

In the forefront of those who are competing, as always, are the communists, our leading industrial workers. And among them is a milling machine operator from the instrumentation shop, member of the Central Committee of the Communist Party of Georgia, V.M. Goncharov; brigade foreman of the experimentation shop, deputy of the Supreme Soviet of the Georgian SSR and delegate to the 26th CPSU Congress, G.A. Metonidze; a fitter from the apparatus shop, deputy of the district Soviet of workers' deputies, A.A. Lomidze; laureate of the Lenin Komsomol Prize, a lathe operator from the apparatus shop, M.G. Gorgadze; laureate of the State Prize of the Georgian SSR, brigade foreman from the instrumentation shop, D. Sh. Mshvidobadze and others.

On the threshold of the third year of the 11th Five-Year Plan, the collective of the association clearly sees the scope and importance of the great new tasks that have been placed before it. They are related to the impending general reconstruction of the Tbilisi Electric Locomotive Construction Plant.

The design is already completed. Being planned are not only an expansion and remodeling of existing shops, buildings and structures, including the construction of new buildings, but, what is very important, also the manufacture of locomotive undercarriages. After all, right now they are sent to us from Novocherkassk. Thus, our plant will have a full and complete cycle for the production of mainline electric locomotives.

The project plans include the application of many progressive technical aspects and the creation of modern mechanized assembly-line production with the organization of centralized and specialized shops. The lack of a breaking-in railroad track loop for testing electric locomotives with a contact circuit will be compensated by creating a station on wheels for testing electric locomotives on the move, under conditions that approach

operational conditions as closely as possible. The realization of these planned projects will allow the size of the TEB 3 to nearly double, both in the production of the electric locomotives and in the rest of the designated products manufactured by the plant.

The reconstruction which is about to begin will be conducted without disrupting production. This undoubtedly will call for a good deal of additional effort on the part of the plant. But it is prepared for it, all the more because we are again receiving substantive help from the fraternal republics of our country.

Photo captions [photos not reproduced]:

The Tbilisi Electric Locomotive Plant today:
1. In the metal design shop
2. Electric equipment shop
3. Members of the expanded, integrated brigade, led by A. D. Gelashvili (second from left), laureate of the USSR State Prize, are performing excellently.

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UDC 69.003:65.014.011.56

USE OF COMPUTERS IN BAM PLANNING, CONSTRUCTION

Moscow TRANSPORTNOYE STROITEL'STVO in Russian No 1, Jan 82 pp 36-37, 43

[Article by Candidate of Technical Sciences V. I. Min'kin and engineers Yu. I. Makarov, L. I. Shkolyarenko (Mostostroy-10) and A. G. Shatilov (SibTsNIIS): "Creating the Normative Base for the First Line of an ASU"]

[Text] Specialists at the Mostostroy-10 trust, the ASU [automated control system] department at the TsNIIS [Central Scientific Research Institute of Transport Construction] and ASU laboratories at the SibTsNIIS [not further identified] and KhabIIZhT [Khabarovsk Institute of Rail Transport Engineers] have been working for five years now to perfect operative-calendar planning and monitoring plan implementation using computers.

Preceding research on this topic, the high level of specialization, centralization, standardization and unitization of the design resolutions being used in the construction of artificial BAM structures and the designs themselves have created real prerequisites for developing and introducing an automated control system in the trust. In implement this task, a technical assignment was worked out and approved in 1978 for planning the first line of the "Mostostroy-10 ASU."

The first line, being planned jointly with the Kazakh Division of the NIIsistem [not further identified], includes the tasks of calendar planning with consideration of directive schedules, technological and resource limitations.

Resolution of these tasks permits operative determination, based on calendar schedules, of annual, quarterly, monthly and weekly work volumes at projects in cost and physical terms and calculation of the labor and material-technical resources needed to perform that work.

Introduction of "Mostostroy-10 ASU" first-line tasks will thus ensure prompt receipt of work plans for the trust and its structural subdivisions which are linked in time and balanced in resources.

Inasmuch as attaining this goal is determined in considerable measure by the quality of the initial data for planning calculations, creation of the normative base comprises the most important link in ASU planning and introduction.

Resolution of the trust ASU first-line tasks is based on data on the structure and work volumes at projects and labor expenditure normatives, the basic wage,

and the expenditure of materials, components and items. The normatives are used not only for planning calculations, but also to monitor work progress and materials expenditures, to substantiate and defend applications for material resources. As the system develops, we propose calculating levels of normative nominal net output and plan indicators for the work of cost-accounting brigades.

The normatives thus have multiple purposes. The availability of high-quality normatives also determines the composition of the tasks being solved by computer. In turn, growth in the normative base will be accompanied by expansion of the circle of tasks being solved, and improvement in its quality will be accompanied by a rise in the level of leader and specialist trust in the calculation results. When developing construction trust ASU's, the normative base is generally created by transferring YeRER [regional unified unit wage rate] estimates and SNiP [construction norms and regulations] resource expenditure norms to computer storage devices. Given their outwardly apparent simplicity, and in view of the fact that construction conditions and work methods are averaged in these normative documents, such norms enable us only to obtain forecast plans which are unsuitable for operative planning, monitoring work progress and providing projects with material-technical resources.

The sphere of application of the indicated norms has turned out to be even narrower under BAM construction conditions. The presence of imported equipment and the features of technological processes in undeveloped regions of Eastern Siberia and the Far East has an effect. This has also predetermined the use of production expenditure calculations for technological methods of performing work which are actually used, with consideration of the accepted detailing of calendar schedules.

The composition of the calculations stems from the content of the tasks included in the first line. Norms for recalculating estimated work volumes in physical units of measure used in bridge-building planning and supervision are determined on the basis of labor expenditure calculations, basic wage expenditure calculations and calculations of material resources requirements.

YeNiR [unified standards and costs] and VNiR [departmental standards and costs] handbooks, flow charts, standard plans, blueprints, time-and-motion data on work using new equipment, and other sources taking local conditions into account are used in the calculation.

All work on developing the normative base is conventionally divided into the following six stages:

analysis of projects under construction and being planned for construction, delineation of relatively homogeneous groups, designation of the sequence of normative development by group;

analysis of individual jobs at projects of each group and delineation of a list of standard jobs for each group;

analysis of methods of performing standard jobs and determination of the composition of the calculations;

preparation of subdivision assignments for working out the calculations;

working out the calculations;

processing the materials received from the subdivisions and transferring them to computer storage devices.

The following system of coding jobs and norms has been adopted for convenience of ASU operation. The job code is a three-unit code and that for the norms is a five-unit code (up to 10 symbols are permitted). The first job and norm code symbols indicate their affiliation with a consolidated design element (fragment). For example, the installation of spans belongs to the fifth fragment and so the job and norm codes in Table 1 are designated with the figure 5. The second code symbols indicate the nature of the work, the third, the place of the work in the bridge structural plan; the figure 1 corresponds to the first support or span, 2 -- the second support, and so on. Zero indicates that the work relates to the bridge as a whole. The third and subsequent symbols in the norm code designate the calculation number.

The coincidence of the first two symbols in the job and norm codes makes it easier to search for them when filling in documents and monitoring the correctness of the norms being used.

The next column of the register indicates the types of resources to be included in the norm. Labor expenditures and wages are mandatory elements of each norm. They are recorded on the first and second lines, respectively, of the norm (see Table 2, following page).

As distinct from the traditional norms adopted in construction, the normative base being developed in the Mostostroy-10 trust include norms for recalculating estimated volumes and physical units of measure. For example, the estimated cost of installing each span is given. But planning work often uses the measure "tons of metal components." Work volume norms in physical units are also introduced for these types of calculations. The availability of such data mak it easier to resolve the tasks of balancing the capacities of construction subdivisions and auxiliary production facilities with the planned work volumes.

Fittings whose cost is not fully taken into account in construction-installation work volume (enclosure channels, casings, and so forth) are also used in bridge construction. Hypothetical norms are introduced to calculate this type of expenditure. They are assigned codes whose first two symbols coincide with the initial symbols of the job code, with the final symbols being 999 (Table 1). Only the cost of these fittings are included in the hypothetical norm.

The expenditure of materials is calculated from specifications in the products list for manufacturing prefabricated concrete and reinforced concrete components and metal items. The specification code is the code of the component or item. The composition and amount of materials being used are determined from the plans. All materials are coded using a unionwide classifier. The specifications are included in the normative base together with the calculations (see Table 2).

The development of norms and specifications is entrusted to trust subdivisions in accordance with their specification (fourth stage of normative base development). The assignments are drawn up by trust order. Attached to the order are a register and document and instruction forms for setting the rates and filling in the forms.

Expenditures are calculated in the subdivisions (third stage) using the accepted methods. Consideration is given to basic, auxiliary and transport operations

The following groups of projects were noted upon completion of the first stage: 1) BAM railroad bridges (excluding outsized); 2) bridges on the temporary highway paralleling the route; 3) bridges on permanent highways; 4) outsized railroad and highway bridges; 5) pedestrian and industrial bridges; 6) temporary project installations (concrete plants, rock crushers, and so forth); 7) temporary housing settlements.

More than 90 percent of all the trust program volume is projects in groups 1, 2 and 4. The greatest degree of component and technological method standardization is achieved at projects in groups 1, 2, 3, 6 and 7.

The second stage in creating the normative base turned out to be more laborious. Thus, all jobs at projects in group 1 were covered by 47 standard categories, which were grouped into consolidated bridge structural elements (fragments). Depending on size, the bridge design resolutions were also subdivided into 5-9 fragments.

Approximately the same number of standard jobs were noted at projects in group 3. The list of jobs at temporary highway bridges (group 2) was considerably shorter. For outsized bridges, it was decided to determine the list individually when working out the construction organization plan.

A third stage is currently being done only regarding work at projects in the third group. As a result, we intend to work out more than 220 top-priority calculations. The result of work on this stage has been the "Job - Norm" register, the form for which is given in Table 1.

Table 1.

	job	job code	norm code	unit of measure	conditions for use of norm	resources to which norms apply
1.	installing metal spans	510	51101	span	installing an 18.8-meter girder span by cantilever crane	labor expenditures; wages; materials; actual work volume
			51102	"	", 23.6-meter	"
			51103	"	", 27.6-meter	"
			51999	"	hypothetical norm	cost of fittings

The "Job - Norm" register is used in subsequent stages of development of the normative base to prepare bridge-detachment assignments on working out calculations, calculating expenditures and determining composition, estimated volume and cost of work at specific projects.

Table 2

Строка	Корректировка	Код нормы	Единица нормирования	Тип ресурса	Номер записи	Наименование ресурса	Код ресурса	Единица измерения ресурса	Количество ресурса в норме	Коэффициент перевода в валовую единицу измерения	Единица измерения валовая	Признак динамики потребления
1	2	3	4	5	6	7	8	9	10	11	12	13
010		5110100000	1 т проектного строения (a)	т (b)	1	Трудозатраты (c)		(d) чел-ч	300.800			
020					2	Зарплата (e)		(f) руб.	289.500			
030				м (g)	3	(h) Бревна стр. IIIс, с диаметром 140—240 мм	5317111002	(i) м³	0.300	1.00	(i) м³	
040				»	4	(j) Канат стальной диаметром 22 мм	1351227008	м (g)	99.000			
050				»	5	(k) Поковки	1311114020	кг (l)	64.000	0.001	т (b)	
060		5113500000	(m) То же	т (b)	1	Трудозатраты (c)		(d) чел-ч	1889.00			
070					2	Зарплата (e)		(f) руб.	1558.90			
080					3	Балки двутавровые (n)	0925310000	т (b)	4.190			
090				м (g)	4	Болты путевые (o)	1391112001	»	01.30			
100				»	5	Рельсы старогодние (p)	1125111003	»	11.100			
110				»	6	Сталь толстолистовая (q)	0971000000	»	0.240			
120				»	7	Сталь угловая (r)	0927300000	»	0.630			
130				»	8	Сталь швеллерная (s)	0925320000	»	0.680			

Key:

(column)

1. Line
2. Adjustment
3. Norm code
4. Rate unit
5. Type of resource
6. Record number
7. Resource
8. Resource code
9. Resource unit of measure
10. Resource amount in norm
11. Gross unit of measure transfer factor
12. Gross unit of measure
13. Consumption dynamics criterion

a. Ton of span
b. Tons
c. Labor expenditures
d. Man-hours
e. Wages
f. Rubles
g. Meters
h. IIIs 140-240 mm logs
i. Cubic meters
j. 22 mm steel cable
k. Forgings
l. Kilograms
m. Same
n. I-beams
o. Track bolts
p. Reusable rails
q. Thick-sheet steel
r. Angle steel
s. Channel steel

within the construction site. VPTItransstroy [probably: All-Union Planning and Technological Institute for Transport Construction] specialists are enlisted in working out the labor normatives. All materials on developing production norms are transmitted to the trust for further processing by the production preparation group and the economics laboratory.

The data submitted by the bridge detachments are verified in the concluding stage of normative base development, after which they are transferred to computer storage devices. Devices for preparing data on magnetic tape are used for this, which substantially accelerates input into the computer memory.

The procedure described for working out a normative base is implemented systematically for each of the seven indicated groups of projects. In the course of operating the system, the normative base will be supplemented with new norms reflecting new jobs, technological methods, or a changeover to new construction regions. Obsolete norms will be eliminated from the normative base.

In parallel with preparation of the normative base, planning-estimate documentation is being processed for putting into the computer memory the composition and amount of work at projects under construction and planned for construction. In this regard, all estimate items are grouped by type of job and norm as indicated in the "Job - Norm" register. This work is done by the trust production preparation group as part of the production department.

The experience accumulated in developing the normative base in the trust shows that this is extremely laborious and demanding work. Many difficulties are associated with imperfections in estimate-planning documentation forms. Practically all estimates must be completely redrawn when preparing data for the ASU. In order to reduce labor expenditures in processing estimates, we think implementation of TsNIIS proposals on standardizing estimate-planning documentation with consideration of trust ASU demands should be accelerated.

In order to reduce labor expenditures on preparing data as proposed by the Mostostroy-10 trust, the Kazakh Division of the NIIsistem has developed programs permitting reuse of data on individual jobs, fragments or bridges as a whole. However, the problem of reducing the labor-intensiveness of preparing data will be fundamentally solved only with the introduction at planning institutes of automated planning systems (ASPR) integrally linked to the ASU's of construction organizations, as well as with the creation of an automated branch normatives fund. ASU developers will then be required to create normatives only for that portion of the jobs not covered by the available fund.

Implementation of the concept of intercomputer exchange of planning documentation and normative data will demand a unity of all ASPR and ASU developments at trusts in all the construction ministries.

The USSR Gosstroy and its institutes working in this area must obviously speed up the development of these materials so as to reduce to a minimum labor expenditures on creating the ASU normative base, as well as on their subsequent restructuring when industry-wide construction classifiers and planning resolutions are introduced.

11052
CSO: 1829/47

SHIPS TO CARRY HYDROFOILS, OTHER LARGE CARGOES

Kiev PRAVDA UKRAINY in Russian 12 Nov 82 p 4

[Article by ship-building engineer M. Neyding and journalist R. Korotkiy from Odessa: "Ships for...Ships"]

> [Text] Sea-going vessels have always transported especially large cargoes. Among these cargoes today are reactor columns for chemical plants and industrial groups, boilers, turbines, generators, large-diameter pipes for gas mains and...even ships.

One of the leaders of such transport on the Black Sea is the motor ship "Zadonsk," which was especially re-equipped to load over-sized and long cargoes, up to 1,500 tons in weight and 100 meters in length. Such experience has been gained on ships of the "Zoya Kosmodem'yanskaya" type.

The all-union association "Sudoimport" [All Union Association for the Import of Ships] has been selling hydrofoil ships abroad for many years. The ships are in great demand on the world market. Previously, these ships were transferred to purchasers by sailing at their own speed. But later, it was calculated that it would be more economical to send the ships as "passengers." One, two and even three "Comets" can "sail" simultaneously on cargo ships' decks.

Historians confirm that in 1421 in Italy, a "privilege," that is a patent, was issued for one of the first specialized ships with a "lifting crane" for transporting heavy cargoes--marble slabs. However, it gook five centuries before ship-builders began serial production of specialized ships for transporting heavy cargoes.

Frequently. such ships are urgently needed. As an example, we can cite a recent case: delivery of river-going tankers from Odessa to Kamchatka. They were loaded, with difficulty, on board the motor ship "Dubna" in the port of Odessa. But in Kamchatka, a special mechanism had to be installed on the deck to unload the tankers from the motor ship. There is no end to instances which confirm the complexity and labor-intense nature of such transportation operations. Building special ships was the natural outcome.

Heavy-cargo ships can lift cargo, with the help of two of their own gantry cranes. Each crane can lift 350 tons and moves on rails or on a pontoon. The ships can be loaded horizontally, due to the open aft holds. Such a ship is lowered in the water, like a floating dock, to take a pontoon with cargo, and then it rises to its normal position. The range of this sea-going titan is 12,000 miles. Such ships have been built, in accordance with our country's specifications and orders, at the "Holling" shipyard in Finland. They were the "three heroes"--the motor ships "Stakhanovets Kotov," "Stakhanovets Yermolenko" (both have been assigned to the Baltic) and "Stakhanovets Petrash" (Black Sea Steamship Line). You can get an idea about the cargo holds of these sea-going titans from their dimensions: 90 meters long, 13.5 meters wide and 8 meters high. These motor ships will provide sea transport of the equipment for future plants, electrical power stations, chemical and metallurgical combines.

The engineers of the Black Sea Central Planning and Design Office, together with the river transport workers and planners, also made a contribution to the transport of such cargo. They developed a plan for transporting five reactor columns, in the shape of three rafts, for Siberian oil and chemical workers. The weight of the largest column is 590 tons.

9887
CSO: 1829/84

SPECIFICATIONS FOR SHIP 'MIKHAIL STREKALOVSKIY'

Moscow MORSKOY FLOT in Russian No 11, Nov 82 pp 21-24

[Article by N. Knyazevskaya, chief of the design bureau of the Murmansk Steamship Company: "The Motorship 'Mikhail Strekalovskiy'"]

[Text] Starting in 1981 the fleet of the Murmansk Steamship Company began to be reinforced with new ships like the "Mikhail Strekalovskiy," which were built at the Warnemunde Shipyard (GDR). The ships are designed for transporting bulk cargo, ores and containers.

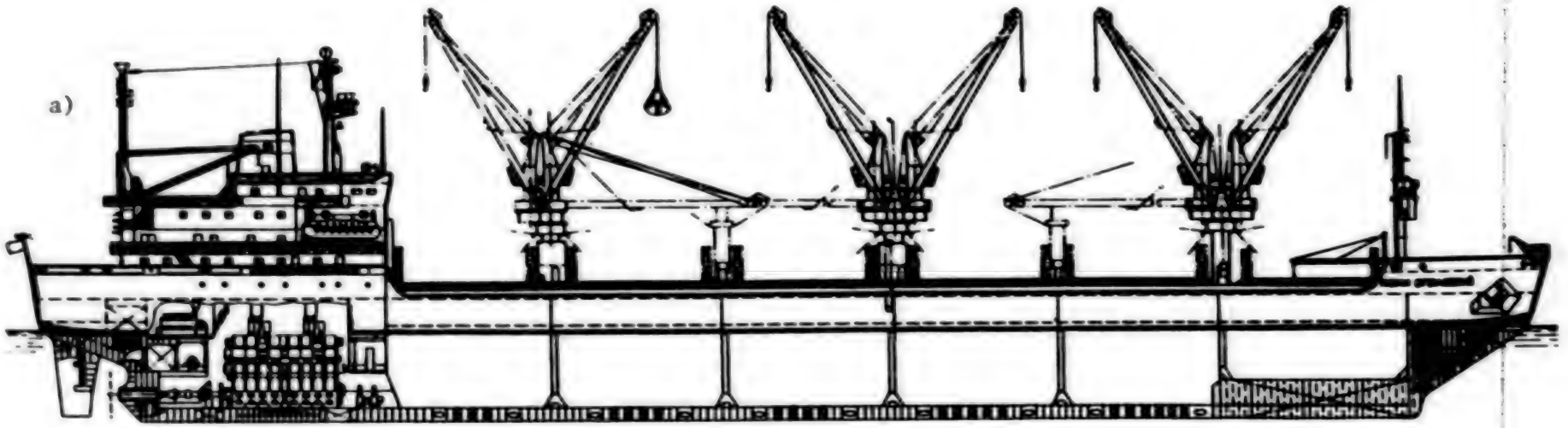
The motorship "Mikhail Strekalovskiy" is a single-deck single-screw ship with a forecastle and the stern location of the engine room, the living and service quarters, with strengthened ice reinforcements. It is the type ship of a modified series of ships like the "Dmitriy Donskoy" (MORSKOY FLOT, No 2, 1979). Its basic difference from its predecessors is the presence of cargo cranes.

Basic Specifications of the Ship

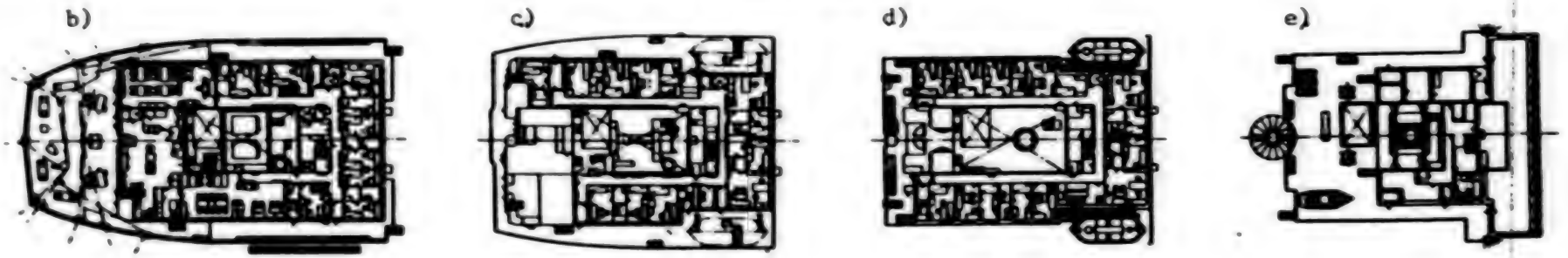
Length:	
overall	162.10 m
between perpendiculars	154.88 m
Beam	22.86 m
Depth	13.50 m
Summer draft	9.88 m
Tonnage:	
gross	4,777 registered tons
net	2,451 registered tons
Power of main engine	8.24 MW (11,200 hp)

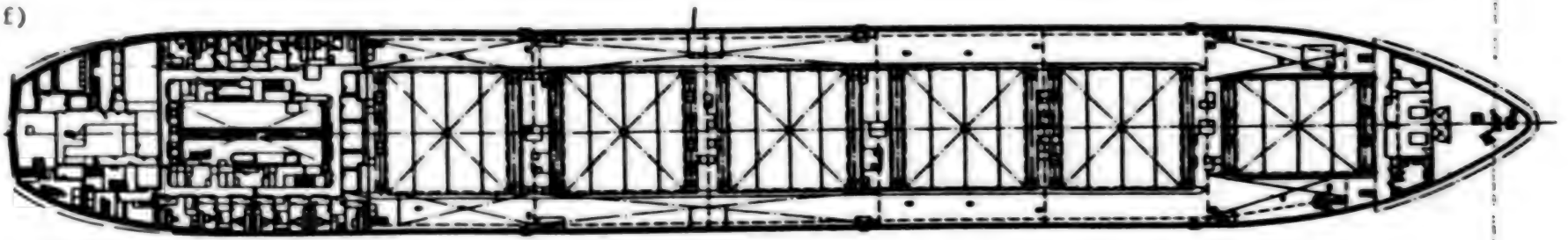
The ship was built for class KM ● UL ◫ A2 (bulk). The operating area is unlimited.

The cargo is carried in six holds with a total capacity of 22,245 m^3. It is possible to carry in the holds and on the deck 442 20-foot or 219 40-foot containers. The cruising range on the ship stocks is 11,000 miles. The speed of the ship in the sea trials with a draft of 9.88 m and a rotational speed of the propeller of 140 rpm was 15.2 knots.



General Layout of the Ship
a--side view; b--poop deck; c, d--super-
structure decks; e--navigating bridge;
f--main deck





The hull of the ship is all-welded, is assembled from planar and volumentric panels and is divided by water-tight bulkheads into nine compartments. The categories and grades of steel of the hull meet the requirements of the USSR Registry for ships, which have been built for class UL and operate at an open air temperature of -40°C. The inner bottom, the bottom and the deck on the sections between the sides and the hatches are assembled according to the longitudinal method of assembly, the structure of the side, including the bilge tanks, is assembled according to the transverse method.

The bow bulkhead of the engine room, the collision and afterpeak bulkheads are flat, the rest are corrugated with vertical corrugations and a flat section on the outside plating. The bottom section of the transverse bulkheads of the cargo holds is made with "housings," the side longitudinal bulkheads in the No 1, 3 and 6 holds are corrugated. The permissible load on the main deck is equal to 17.52 kN/m^2 (1.79 tf/m^2).

The outside plating of the ice strake in the area from the bow to the beginning of the second hold along the length of the ship and from the upper limit of the ice strake to the bottom along the height of the side has been thickened by 10 percent as compared with the requirements of the Regulations of the USSR Registry for ships with class UL. The outside plating in the area of the shoulder to the aft of the 151st frame and the webs of the deep frames of the cargo holds have been additionally strengthened and the moments of resistance of the main and filling frames have been increased. Bilge keels have been installed in the midsection of the ship for stabilization.

The hatch covers of the cargo holds are water-tight and folding, with hydraulic drive. In open position the covers are placed on the bow and stern edges of the hatches. There are portable hydraulic jacks for separating the hatch covers. The emergency opening of the holds is envisaged on one cover of each hatch. The serviceability of the hatch covers is ensured at temperatures to -40°C. The permissible load on the hatch covers is equal to 17.16 kN/m^2 (1.75 tf/m^2). On the hatch covers there are placed in two layers 20-foot containers weighing 15 tons each or 40-foot containers weighing 30 tons each.

The ship has three rotating paired cranes with a lifting capacity of 12.5 tons with a variable reach of the boom and a crane with a lifting capacity of 3.2 tons for the servicing of the food storage spaces and the engine room and for the launching of the work boat. Grab buckets with a capacity of 6.3 m^3 are installed on the cranes for the handling of bulk cargo, while after the refitting of the cross-pieces the cranes can be used for handling general cargo.

The ship is fitted with three anchors of the Gruzon type weighing 5.6 tons each (one of them is a reserve), one stern stream anchor of the Gruzon type weighing 3 tons, two anchor chains with a gauge of 67 mm and a total length of 577.5 m and an anchor chain with a gauge of 40 mm and a length of 110 m. The casting and raising of the anchors are carried out by two anchor and warping capstans, which are mounted on the forecastle deck, and one stern anchor and warping capstan on the poop deck.

Four automatic electric mooring winches with a tractive force of 30-89 kN have been installed on the ship. The winches are mounted on the forecastle deck and the poop deck.

The rudder is balanced and semisuspended, of welded construction; the steering engine is an electrohydraulic, two-cylinder enginer, with a nominal rudder-stock torque of 320 kN·m.

The boat gear consists of two fiberglass motor lifeboats with a capacity of 42 people each; two inflatable life rafts for 12 people each and a raft designed for 6 people. On the ship there are eight life-buoy rings, of them two have lighted smoking buoys and two have lighted buoys; 48 life jackets. Electric boat winches with a tractive force of 40 kN have been mounted on the boat deck for the launching and raising of the boats.

The living and service quarters of the crew are located in the stern section of the ship. In all 14 cabins for the command personnel, including 8 block cabins and 6 single cabins; 22 single cabins for the crew; 2 double cabins for the trainees, are envisaged. All the cabins are furnished with separate bathrooms. A double cabin has been installed on the deck of the navigating bridge for the pilots.

In addition to the mess rooms, the dining room and the rooms for the relaxation of the command personnel and the crew, on the ship there are a gymnasium, a library, a photography laboratory, a room for personal studies and a sauna.

The main engine of the ship is a two-stroke crosshead-type reversible single-acting diesel engine with loop scavenging and turbogas supercharging like the K8Z70/120 E, which is built in the GDR in accordance with a license of the firm MAN.

The engine runs on diesel and heavy fuel with a Redwood 1 viscosity of up to 1,500 at 100°F and a pour point of 10°C. Under the conditions of ice navigation the engine runs only on diesel fuel.

The shaft line consists of a connecting and a propeller shaft with oil-lubricated bearings and seals such as the Simplex. The strength of the shaft line is 10 percent greater than the strength required by the Regulations of the USSR Registry. The propeller with detachable blades is made of chrome-nickel steel.

The ship electric power plant consists of four 8VD36/24A-1 diesel generators with a rating of 441.3 kW (600 hp) at 500 rpm with a generator like the SSED 639-12 with a rating of 400 kW at 500 rpm. The voltage of the generators is 390 V. A diesel generator like the 6VD21/15-2 with a rating of 100.8 kW (137 hp) at 1,000 rpm with a generator with a rating of 85 kW at 1,000 rpm and a voltage of 390 V is used as an emergency electric power source.

The boiler plant consists of two auxiliary two-drum boilers like the L4 X 7 and R4 X 7 with a steam rating of 4 tons/hr each. The boilers are equipped with rotating atomizers and can run on diesel or heavy fuel. The steam pressure is 490.3-686.5 MPa (5-7 kgf/cm^2). An exhaust-heat boiler like the AKS 2.2/2.4 with a steam rating of 2,400 kg/hr at 85-percent power of the main engine has been installed on the ship; the steam pressure is 686.5-784.5 MPa (7-8 kgf/cm^2), the temperature of the feed water is 60°C. The long-term parallel operation of the boilers is envisaged. The boiler plant is completely automated and is equipped with emergency warning and protective systems.

There are three main starting air compressors like the 2S125e with a delivery of 150 m^3/hr and a booster compressor like the 2S175v with a delivery of 15 m^3/hr for meeting the needs for compressed air. There is a compressor for everyday needs like the AHV 1-90/125 with a delivery of 160 m^3/hr. The refrigeration plant of the food storage spaces is served by two compressors like the 2H2-56/10-078/0, which run on the refrigerant freon R22.

The air conditioning plant of the living and service quarters consists of air conditioners and compressors with a delivery of 2 X 6,000 and 1 X 600 m^3/hr. The compressors run on freon R22 and R12.

For the supply of the ship with fresh water it is equipped with a desalinating plant with a capacity of 20 tons/day with a temperature of the outside water of 32°C. Ultraviolet units are intended for the disinfection of the drinking and wash water. There are four separators like the MAPX 204 for the separation of fuel and oil and a separator like the TE-10i with a capacity of 10 m^3/hr for the purification of bilge waters. The bilge waters are collected in a tank with a capacity of 66.8 m^3, while the waste waters are collected in a tank with a capacity of 45.7 m^3.

A plant like the KA-MR 1.5 500, which is designed for 35-100 poeple, treats the waste waters.

A furnace with a double jacket and an atomizer, which operates on diesel fuel, has been installed in the engine room for incinerating garbage.

The extent of mechanization of the motorship "Mikhail Strekalovskiy," as on other ships of this series, makes it possible to service the main power plant while under way with one watch engineer from the central control panel without a constant watch in the engine room for 24 hr and without watch keeping at the central control panel and in the engine room at the berth.

The automatic equipment of the diesel generators, which was designed on a relay basis, makes it possible to carry out the cyclical and pre-operational priming of the diesel engines, the issuing of commands, the remote starting and shutdown of the diesel generators from the control panel or the main switchboard, the synchronization and switching of the generators to parallel operation, the automatic connection of the standby diesel generator, cut-out in case of overloading, the monitoring of the units and their relief and shutdown in case of critical malfunctions, the interlocking of the start-up of the units after shutdown as a result of a malfunction.

The monitoring of the operation of the entire engine plant in the case of watchless service is carried out from the central control panel by the emergency warning system. Moreover, the emergency warning system informs the watch mate, who is on the bridge, of the status of the power plant.

In addition to the emergency warning system, which is installed on the central control panel, there is the general emergency warning system for calling the engineer on duty. This system warns of those malfunctions, which in the emergency warning system are given as individual signals, while here they are given as a general signal, which is divided into two degrees of urgency: critical and noncritical. The ship is equipped with modern means of electrical navigation and radio communications.

PHOTO CAPTIONS

1. p 22. The "Pavel Vavilov"--a ship like the "Mikhail Strekalovskiy."

2. p 24, top. The cargo-handling equipment.

3. p 24, bottom. The radio room.

7807
CSO: 1829/71

FINNISH PRESS: FINNISH FIRM AIDING IN RIVER-BARGE PLANTS

To Be Near Ob, Volga

Helsinki UUSI SUOMI in Finnish 17 Dec 82 p 24

[Article: "Barge Factories from Aspo to the Soviet Union"]

[Text] The Finnish Aspo Oy firm is due to deliver two river barge producing plants to the Soviet Union. The value of the contract that was concluded with the V/O Avtopromimport is approximately 200 million markkas.

The first installation is to be delivered in 1984 at the headwaters of the Ob River, near the city of Tomsk in southern Siberia. The second delivery will take place during 1984-85 at a point along the Volga River near Ulyanovsk.

The contract includes the buildings, machines, and equipment, and the production technology for the factories, which will have a production capacity of 40 barges annually. The contract includes also installation supervision, initial production runs, and training. The barges will be designed for the carrying of piece goods shipments. They will be 70 meters long, 14 meters wide, and will have a carrying capacity of 1,100 tons.

The production of Finnish domestic resources used in the production is high, and it will create hundreds of jobs in the Finnish metalworking industry. It will include a large amount of specialized equipment that will be designed and manufactured in Finland.

This project export venture represents a continuation of its operations for the Aspo firm in that in spring 1981 it concluded a contract to provie two complete steel service centers to the Soviet Union during 1982-83. These steel service centers are the only ones of their type in the Soviet Union. The total value of the Aspo firm projects in the Soviet Union now is about 400 million markkas.

Additional Details on Barge Plants

Helsinki HELSIGIN SANOMAT in Finnish 6 Jan 83 p 22

[Article: "Shipyard Materials from Peraseinajoki To the Soviet Union"]

[Text] The Oy PPTH-Norden Ab firm has concluded a contract with the Aspo Oy firm to supply to the Soviet Union the materials for the construction of two river barge-producing shipyards there by the latter firm. The value of the order is 40 million markkas.

The order includes the construction planning of the shipyards, the construction materials, and supervision of the work of installation. Steel frames and structures for buildings, about 3,500 tons of roof supports, and 85,000 cubic meters of wall structures are being fabricated at the PPTH machine shops at Peraseinajoki and at Kerava.

The drafting work on the plans is under way, and deliveries for the first installation will begin in late 1983 and for the second in late 1984.

The shipyards will be built at Samus on the Ob River and at Kriushi on the Volga River. The construction work on both will begin in spring 1984 and each will require two years.

The PPTH machine shop and main office will employ 30 workers and management personnel for one year, and employment for at least a year will be provided in the Soviet Union for installation supervisors.

The total amount of work outstanding by the PPTH firm was about 117 million markkas at the beginning of 1983, of which 27 million markkas will carry over to 1984. The total business turnover during 1982 was about 160 million markkas.

Tuotantotilat laitosta kohden ovat toimituksessa 2,2 hehtaaria.

[Caption] The contract specifies a production area of 2.2 hectares in each installation.

5955
CSO: 3617/53

RAILROADS' PROBLEMS IN HANDLING TRANSSHIPMENT AT PORTS

Moscow MORSKOY FLOT in Russian No 10, Oct 82 pp 12, 13

[Article by M. Gavrilenko (Soyuzmorniiproyekt) under the heading "Management and the Economy": "Port Track System Problems"]

[Text] The Soviet maritime fleet has been developing both quantitatively and, primarily, qualitatively over the past two decades: it has widely introduced modern, highly efficient methods of transporting and transshipping cargo using progressive technology. During the 9th and 10th five-year plans, the maritime fleet was reinforced with modern container ships with capacities of 39 to 1,400 containers (recalculated to 20-foot containers), "rolkers" [not further identified] with capacities of 230 to 1,400 containers or wheeled equipment units, ferries and other specialized ships.

It should be noted that simultaneously with the fleet, other types of transport are updating their rolling stock. Specialized new flatcars equipped with semiautomatic fasteners and special trains for hauling passenger cars in which the train's own power is used to load and unload the cars are operating on the main rail lines. Motor transport is being reinforced with specialized container-hauling equipment.

The simultaneous retooling of related types of transport enables us to organize cargo transfers on a new technological basis with significantly higher intensiveness and minimal expenditures of time, labor and materials.

The construction and operation of new transport equipment requires significant expenditures, in view of the specificity and complexity of their design. Thus, whereas it costs 1,800 to 1,900 rubles per day to maintain a 7,000 to 8,000-ton multipurpose ship, these expenditures are 6,200 to 6,500 rubles per day for a 7,100-ton "rolker" of the "Skul'ptor Konenkov" type. Ships of this type can carry 770 containers and have the equipment to unload or load them in 18 hours (six flow lines which can each handle seven containers per hour). To transfer 770 containers directly onto rail rolling stock (special flatcars), we would need to load 386 flatcars during that same time period.

Theoretically, the specialized TPC's (technological port complexes) must be able to cope with this task. To do so, they have available to them in enclosure and rear areas special transshipment equipment (container reloaders, gantry cranes,

container trucks, lift trucks) which is called upon to ensure intensive ship and rail rolling stock processing. However, the TPC's are in practice deprived of an opportunity to carry out this task due to inadequate development of the track system. Twenty-two flatcars (holding 44 containers) can be provided at the enclosure freight yard, consisting of two 175-meter railroad tracks. Flatcars delivered to the first track will be loaded in 30 minutes. Flatcars will be loaded on the second track the following 30 minutes, but during that time the loaded flatcars on the first track must be replaced by empties. Obviously, this operation would have to be repeated 33 times to unload a ship. In order to do this, we need to have near the loading area a rather well-developed network of classification yard tracks to receive empty flatcars arriving from the station marshalling the freight trains and sending them to the yard. In order to hold 386 flatcars, we need to have about 6,000 meters of usable classification yard track or to marshal and send more unit trains. All this work is associated with unloading just one ship of the "Skul'ptor Konenkov" type in a direct ("ship - car") variant.

It is evident in the diagram offered below of one of the container complexes at Leningrad seaport how docks capable of processing three ships simultaneously are in a straight line. Also evident is the fact that the TPC railroad track system is developed very poorly and cannot meet the requirements of intensive ship processing. [Diagram on following page.]

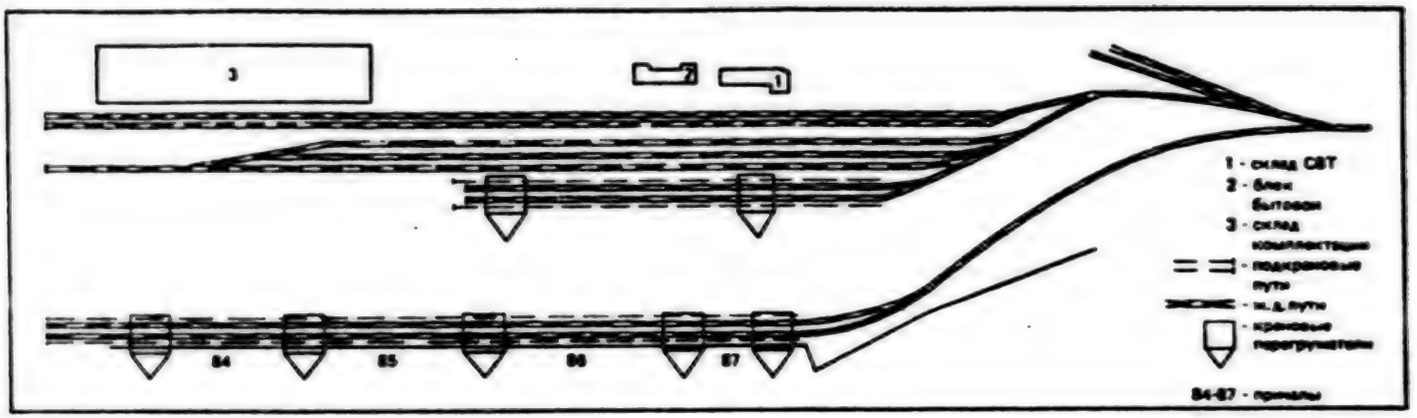
The 535-meter long cargo front (three docks) enables us to set up 35 flatcars on each track. The two enclosure-area dead-end tracks are connected by a switch 900 meters from the dead end. In order to get off the rear tracks, a locomotive must travel another 300-meter single-track stretch and go beyond the main switch connecting the entire port cargo-region rail system with the branch leading to the yard (five kilometers from the port region). Consequently, in order to put 35 flatcars on a single loading-unloading track, the locomotive brigade must spend about 20 minutes (to travel 1,435 meters at 5 km/hr).

The locomotive brigade requires about one hour to get off the first track, change over to the rear tracks through the main switch, couple onto the next lot of empty flatcars and put them on the next track (traveling 1,435 meters three times) and needs 30 minutes to load the flatcars supplied onto the first track. Thus, each flatcar reload is delayed by 30 minutes. In this regard, nonproductive ship and transshipment equipment idle time is 50 percent of all working time.

A similar situation develops in switching operations to load cars with bulk cargo. A 20-car feed is loaded onto two tracks in 40 minutes. But a train is being supplied once every four hours, under a junction agreement between the port and the railroad station.

Practice has shown that docks with an open-ended rail throughfare or four or five dead-end tracks 350-400 meters long operate quite a bit more productively. One example would be the operation of dock No 7 at the port of Odessa, where cars can be supplied from the side of dock No 8 and lead away through docks Nos 5 and 6. When it became necessary to quickly unload 54,000 tons of grain from the "Yalta" steamship, the Black Sea Steamship Line and the port of Odessa, jointly with the Railroad Administration and Port-Odessa Station, worked out a

Diagram of a Container Complex



Key:

1. SVT [not further identified] warehouse
2. General services
3. Complete set assembly warehouse

Crane tracks

Railroad tracks

Reloading cranes

84-87 Docks

plan for unloading the ship. In three days, more than 1,000 cars were loaded at a single dock and the productivity for unloading the grain from the ship was 350 cars per day.

The theory and practice of designing and building the track systems in ports and at port stations have heretofore been based on extensive, low-productivity transshipment-process technologies which have not taken into account the opportunities provided by new means of transport and transshipment equipment. The reason is discrete (departmental) planning. Plans for seaport hydraulic engineering installations, transshipment equipment installed on the docks, auxiliary buildings and facilities, are developed in maritime transport organizations and plans for port stations, dock spur tracks and railroad tracks within ports are developed in corresponding rail transport organizations Each planner proceeds from prescribed annual separately-derived amounts of cargo handling and rail car circulation without consideration of the intensiveness of processing transport units.

The intensiveness with which large means of transport are processed depends on the number of flow lines involved in processing them and the speed with which smaller-sized means of transport are exchanged in interlinked work under a direct variant. In this case, as calculations made in connection with processing the "Yalta" demonstrated convincingly, the railroad track system at the cargo fronts and the outlets to the classification ·ards are of most important significance. Economic expediency dictates the necessity of rapidly developing the classification-yard feeder track system for port complexes specialized to unload bulk-cargo ships, container ships and "rolkers."

As was already noted, in order to process rolling stock for all types of transport more intensively, the specialized TPC must be equipped with classification yard feeder tracks. Using consolidated calculations, the construction of one kilometer of track within a port costs 69,000 rubles, corresponding to expenditures on holding one ship of the "Skul'ptor Konenkov" type at anchor for 11 days. At the same time, each additional kilometer of railroad track enables us to cut hundreds of days of nonproductive idle time for many ships and cars.

In this connection, it seems extremely necessary that we develop tracks connecting the station classification stock with classification-yard feeder tracks within the ports when they serve cargo fronts.

One of the primary tasks in developing seaport track systems is to ensure the processing of means of transport with maximum intensiveness. This enables us, if not to eliminate nonproductive idle time, at least to sharply reduce it for expensive ships and railroad cars. Only thus can we rapidly recompense the considerable capital investments connected with creating specialized technical means of transport and track systems, to obtain a strong economic impact from introducing progressive cargo transshipment and conveyance technology.

Work on developing the track system at transshipment complexes can be done using bank credits for introducing advanced technology. To do this, planning organizations serving ports and stations must jointly work out technical-economic substantiations and recommend that maritime steamship lines and ports, railroad administrations and stations, fill out bank loan applications proportional to the economic impact of their introduction.

Understanding the state importance of such measures, the banks will unquestionably support the requests of the steamship lines and railroads. But as concerns building materials and personnel, it must be assumed that the stations and ports will be able to solve these problems successfully through joint efforts, as has been done by Novorossiyskiy transport workers, which are restoring on the piers railroad tracks previously taken out of operation.

Under these conditions, the transport junction will be developed and will operate as a unified, complex mechanism, and the collectives of seaports and railroad stations are in fact called upon to resolve a common national economic task.

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MISCELLANEOUS

'MORCONTAINER' OFFICIAL ON TRANS-SIBERIAN CONTAINER SERVICE

Moscow VODNYY TRANSPORT in Russian 21 Sep 82 p 1

[Interview with V. Mirzabeyli, deputy director of the office for planning and organizing container transport in the All-Union "Morcontainer" [Sea Container] Association, by VODYNYY TRANSPORT correspondent Yu. Lukasik: "The Millionth Transsiberian Container"]

[Text] Today the millionth container, since the beginning of transport through the Transsiberian Container Service (TSCS) will be festively conveyed from sea to rail transport at Vostochnyy Port. At our correspondent's request, V. Mirzabeyli, deputy director of the office for planning and organizing container transport in the All-Union "Morcontainer" Association, comments on this event.

[Question] Please tell us, Vagif Alibalayevich, when and how did transport of transit containers begin across the Soviet Union?

[Answer] Transport of goods across our country from Europe to Japan was initially developed even before the Second World War. The advantages of the route were evident to the goods' owners even then. Indeed, the sea routes through the Suez and Panama Canals, as well as around Africa, are 20,000 to 27,000 kilometers long. The transsiberian route is only 13,000 kilometers long.

Prior to the Great Patriotic War, transport of transit goods across our country was accomplished on the basis of a 5 January 1925 decree. According to that document, entry and exit tariffs were not levied against foreign goods being transported across the USSR on open transit routes.

Nevertheless, for various reasons, such transport was not significantly developed in the 1930s, and during the Second World War, they ceased altogether. They were renewed only in 1967, and on a massive scale in 1971 when goods began being transported in large capacity containers. Since then, the volume of transport has constantly increased. So today, we celebrate the passage of the millionth container through the TSCS.

[Question] It is usually considered that railroad workers and sailors are transporting the transit goods. Do other types of transport take part in this operation?

[Answer] Of course. Today railroad workers, sailors, truck drivers, river transport workers and aviators take part in delivering containers with goods from Europe to Japan and other Far East countries, and back!

The sailors bring goods from Western European to Soviet ports, where they transfer the goods to the railroad. Truck drivers haul goods from internal European areas to Brest, where they also transfer the goods to the railroad. A considerable number of containers arrive via rail at Soviet border stations. Then they all follow along the Transsiberian Main Line to Nakhodka and Vostochnyy Port. It is only IL-76 airplanes which deliver goods from Luxenbourg to Vladivostok, then they are shipped by truck to Vostochnyy. From Vostochnyy, the goods of the TSCS are shipped to our eastern neighbors on board four Soviet and four Japanese container-carrying ships.

By the way, with the activation of the Baykal-Amur Main Line, the route travelled by the goods will be shortened and thus their time in transit will be lessened.

[Question] The second decade of massive transport of containers on the TSCS is underway. What changes have occurred since 1971 in organizing container traffic?

[Answer] To begin with, let's compare two figures: 2,325 and 153,388. The first figure is the number of containers transported in 1971. The second figure is the number transported in 1981. That is almost a sixty-fold increase. Naturally, the degree of work organization could not remain the same as before. The constant improvement of the TSCS is being achieved primarily by modernizing and activating new terminals and expanding the geographic range of transport. We are also utilizing modern ships on the maritime sections of the route, increasing the use of through-trains, carefully studying the state of the market for transit operations, introducing a system for tracking and controlling container movements, and other measures.

The geographic range of transport on the TSCS is being expanded. Goods in containers are coming from Europe over the Transsiberian Main Line, then by sea to Japan, Hong Kong and Manila. Since July 1980, when the FAL ("FESCO Australian Line") linked up to the TSCS, goods have been shipped from Europe to Australia, and back.

A very important factor is the "Container" Unified Automated Control System for Transport Junction Operatons--YeASUTU--which was introduced at Vostochnyy Port. This was the first multiple-access automated control system in the country. Today sailors, port workers, railroad workers and employees of the all-union association "Soyuzvneshtrans" [All-Union Trust for External Transport of Goods] can't get along without data from "Container."

"Container" has been in operation since 1979. Largely due to this computer, the traffic capacity of the container terminal increased by 50 percent, labor productivity in freight operations doubled and the cost for transshipment of containers decreased by one-third.

Compared to the planned capacity, automated control enabled the effective capacity of a warehouse to double, by regulating double-tiered and triple-tiered storage of containers; automated control also helped reduce the storage time for containers by two days. Now you don't have to waste time searching for needed containers, since all freight and auxiliary operations are planned with the aid of the computer. Also important is the fact that, due to the complete automation of preparing all freight, transport and accounting documents, labor productivity has significantly increased for the management and accounting personnel at the terminal, for the port's transport and forwarding office and for the "Soyuzvneshtrans" officials.

The unified automated control system saves more than R3,000,000 per year. Due to its introduction, a regional Far Eastern container and transport cooperation system has been set up and is operating among the neighboring transport workers--sailors, railroad workers and the local "Soyuzvneshtrans" office. The sphere of operations for this system ranges from the receiving station of the Far Eastern Railroad at Arkhara to Japan. At any moment, the computer can provide the location of one or another container within the limits of the transportation region. In the future we hope to be able to track container movements across the entire USSR.

[Question] How could one formulate the basic task which TSCS employees are working on?

[Answer] They key issue for us is increasing the quality of transportation services. By that we mean, first of all, reduction of traffic time for containers through the entire TSCS. Various methods are being used to solve this problem. One of them was introducing the "Container" Unified Automated Control System for Transport Junction Operations. Here is another method.

Ship operations on the Far Eastern maritime section of the route are organized according to a single schedule, which makes it possible to assure a smooth flow of ship traffic and to determine arrivals in harbor on specified days of the week. Prior to the introduction of such a schedule, container-carrying ships arrived at the ports of Kobe, Yokohama, Simidzu and Nagoya at irregular intervals. Now the intervals are constant.

Just by coordinating the operations of these ships, we managed to considerably improve the indices for activity at container terminals, and reduce by nine percent the turnover time for motorships of the "Aleksandr Fadeyev" type. This nine-percent reduction was equivalent to putting into operation an additional ship with a 250-container capacity.

[Question] That is not the only example of initiative by the sailors directed at improving the quality of transportation services, is it?

[Answer] Of course not. I'll give you another example. Motor ships of the "Sestroretsk" type were designed and built to carry 218 containers. Motor ships of the "Aleksandr Fadeyev" type were designed for 304 containers. Innovators from the Far Eastern Steamship Line modernized these ships. Now the "Sestroretsk" type can take 302 containers on board and the "Aleksandr Fadeysv" type can carry 400 containers. Thus, their capacity increased by 38.5 and 31.6 percent, respectively.

In addition, these types of motor ships were designed to transport containers eight feet in height. Now they can carry containers 8.5 feet in height, due to raising the hatch coamings which was also proposed by specialists from the Far Eastern Steamship Line.

Since we have started talking about the initiaitve of the sailors, I must name our best crews, which consistently load a large number of ships and always remain right on schedule. Such are the crews of the motor ships "Mikhail Prishvin," "Pioner Nakhodki," "Aleksandr Fadeyev" and "Pioner Vladivostoka." Also, the port workers at Nakhodka and Vostochnyy do excellent work.

I am convinced that in the future as well, they will do everything to improve the quality of services in the TSCS, and increase the effectiveness of their own operations.

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